

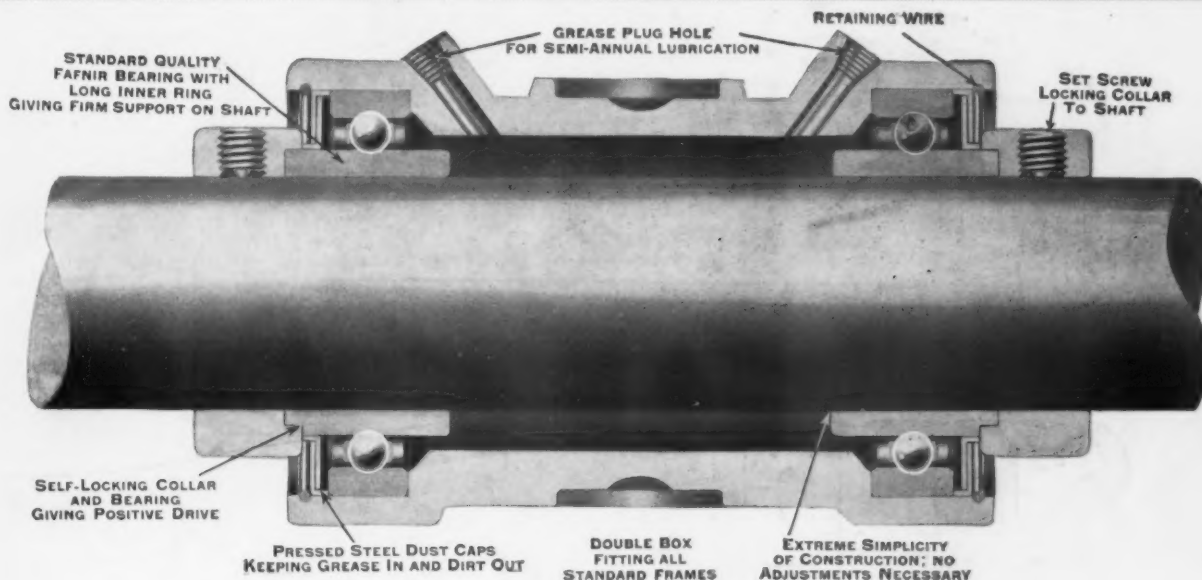
APR 3 1925

THE IRON AGE

Vol. 115, No. 14
Published Weekly

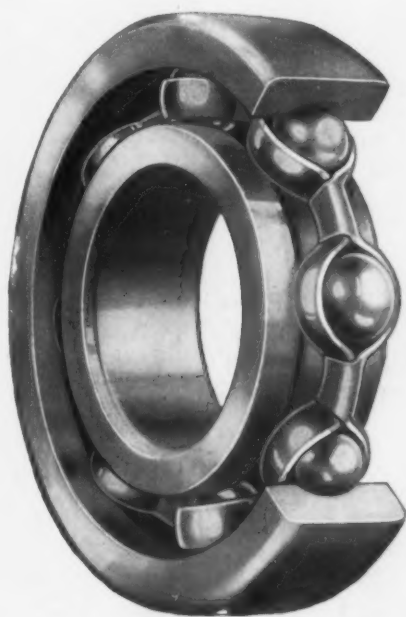
NEW YORK, N. Y., APRIL 2, 1925
Entered as second-class matter June 18, 1879, at Post Office
at New York under the Act of March 3, 1879

Single Copy, 25 Cents
Six Dollars a Year in U. S.



FAFNIR DOUBLE BALL BEARING HANGER BOX

Note:—The entire Fafnir Power Transmission Line is of this same simple, sturdy design



THE savings that any plant can effect with Fafnir Power Transmission Equipment on shafting and Fafnir Ball Bearings in machines have been proved beyond doubt by our own tests and the tests and experiences of our customers. Power bills reduced 15%, lubrication costs cut 50%, less maintenance, uninterrupted service—these economies are all demonstrated facts.

With such savings available, any executive who does not take advantage of these easy profits is deliberately letting money slip thru his hands. His must be the responsibility.

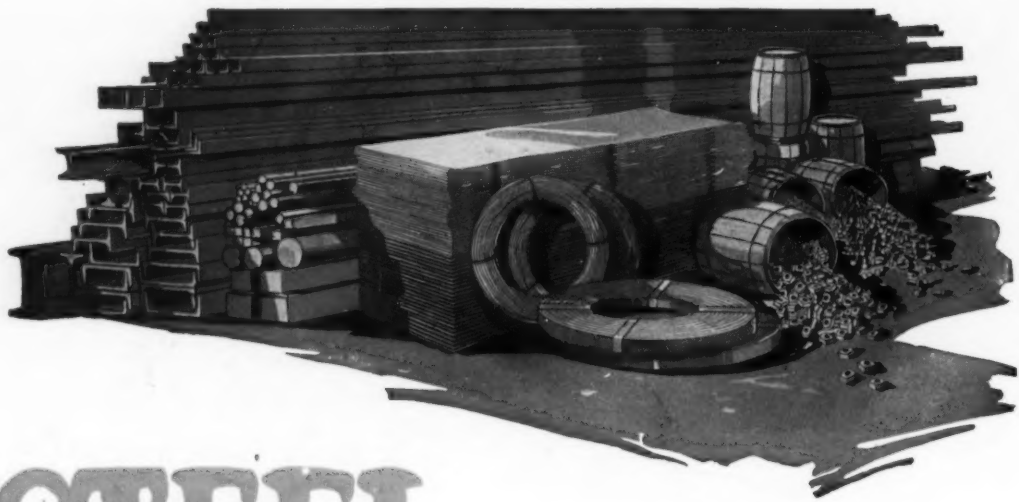
THE FAFNIR BEARING COMPANY

DETROIT

New Britain, Conn.

CHICAGO

*Makers of high grade ball bearings—
the most complete line of types and sizes in America.*



STEEL

- in any size or shape**
- in any quantity**
- shipped immediately**
- from our nearest plant**

Bars
Shapes
Structurals
Rails
Shafting

Tubes
Plates
Sheets
Billets
Babbitt

Rivets
Bolts
Nails
Wire
Chain

Reinforcing Steel
Firmtread Plates
Strip Steel
Forging Bars
Turnbuckles

Boiler Fittings
Alloy Steel
Tool Steel
Small Tools
Machinery—etc.

*Write for the Ryerson Journal and Stock List
—the "key" to immediate steel.*

JOSEPH T. RYERSON & SON INC.

ESTABLISHED 1842

PLANTS: CHICAGO
MILWAUKEE

ST. LOUIS
CINCINNATI

DETROIT NEW YORK
BUFFALO

BRANCH OFFICES:
MINNEAPOLIS

DENVER

HOUSTON
SAN FRANCISCO

TULSA NEWARK
JERSEY CITY

RYERSON STEEL-SERVICE

THE IRON AGE

New York, April 2, 1925

ESTABLISHED 1855

VOL. 115, No. 14

Net Profits from Modern Equipment

Lowering Production Cost to Get Lower Selling Price and,
in Turn, Increased Consumption and Better Net Profits
—Some Examples of Progressive Policy

BY COL. FRANK A. SCOTT*

"**T**HINKING and planning never become automatic. When we can let down, we do. And that is the reason why management tends to let down in efficiency in periods of prosperity."

This statement by Col. Leonard P. Ayres, statistician and economist of the Cleveland Trust Co., Cleveland, known nationally for the accuracy of his business thinking, is a note of warning, worthy the attention of every executive in the metal-working industry.

Such an assertion contains a note of challenge and while perhaps the charge can be refuted, study discloses there is much to sustain it, at least so much that it can not be repelled by mere assertion of its falsity.

What standard can be used with justice to determine efficiency? The short and popular reply is, "results." However, results tell only a part of the story. Unfortunately, for the ease of the one who would furnish the true answer to the challenge, the standard must be, "results related to opportunity."

On results alone the palm for efficiency may be awarded to American manufacturers without further discussion. When "results are related to opportunity" and the American then compared with his English and German brethren, a wider field of controversy is reached.

America has had, and continues to have, raw materials; a population brilliant in mechanical resourcefulness and apt in mechanical work; the largest home market in the world; in short, every requisite for mass production and every incentive to utilize it. The American manufacturer has utilized his opportunities, too, and the automobiles, sewing machines, electrical equipment, transportation facilities and countless other needs and comforts enjoyed by millions of his fellow-citizens, prove this.

*President of the Warner & Swasey Co., Cleveland; chief of the Cleveland Ordnance District.



THE Executive Who, For the Moment, Pockets His Natural Pride in His Own Factory, and "With the Blinders Off" Goes Through His Plant, Will Find His Reward in the Net Profit Column

Expansion of industry has been an accepted doctrine in our country since the beginning; then came the World War with an impetus for production that over-expanded industry to a degree which we have not yet been able even to measure. If mere production were all, this would be a most welcome state of affairs; but production must be related to consumption and these to net profits, and here the trouble begins.

Competition, both internally and internationally, is present in its fiercest forms. If Darwin had not already familiarized the world with his theory of the survival of the fittest, it would have become a familiar doctrine now.

The problem is not, Can we produce the goods? The problem is Can we increase the consumption by lowering our price, and can we accomplish this by decreasing our cost? If the possible consumers of the given article be represented by a pyramid, it is evident that the apex of

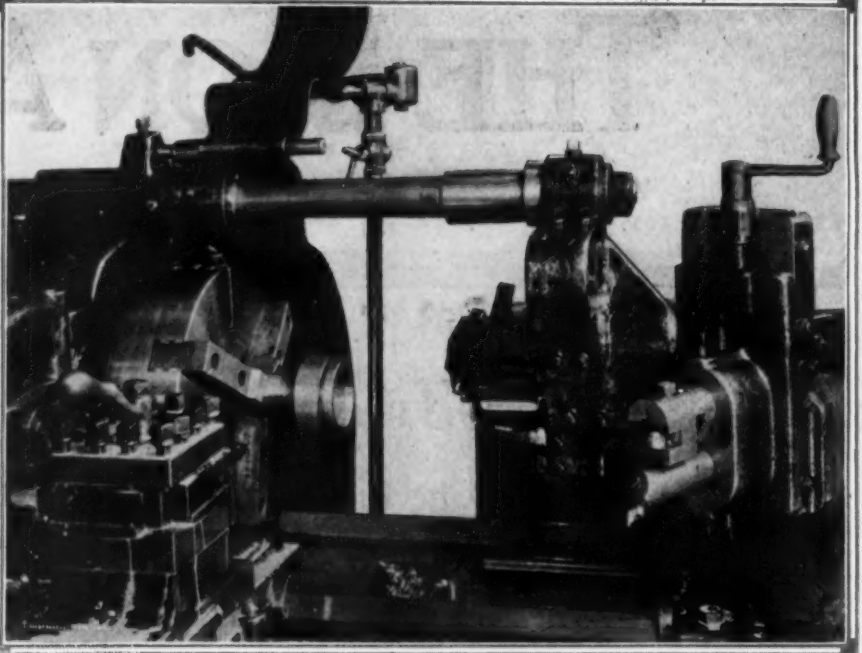
the pyramid will contain those whom price affects but slightly. The farther we go toward the base of the pyramid, the larger the number of possible buyers and the greater the influence of price.

In seeking to lower cost and thus lower prices, the mind naturally turns to the buying prices of our requirements, either of labor or material. This is a proper field for economy, to be sure, but very limited. Our real chance lies in lessening the cost of producing the article by means of better methods or machinery.

Inefficient Machines and Obsolete Methods Not Rare

Volumes have been printed on the inefficiency of the worker, and doubtless he responds to education, stimulation and reward. The inefficiency of machinery, also, has not passed unnoticed. However, it still is not rare to find an American factory furnishing a comfortable home for machines and tools that are scandalously inefficient and "pointing with pride" to methods that make the dodo look like a newcomer. Recently we discovered

THIS Investment Earned More Than 119 Per Cent Per Year. In studying his equipment problem in co-operation with a machine-tool builder, a manufacturer of fire apparatus found that he could reduce the machining time of certain shafts from 80 min. to 30 min. The initial expenditure for the new equipment seemed large, but at the end of the year the investment showed a substantial net profit



a lathe operating in Salt Lake City that had been carried there by ox team before the railroad was built, and certainly was not producing one-third of the output of any one of a dozen modern machines. The time wasters in our plants are far too often our machines and tools; they, more frequently than the worker, are employed and then, regardless of efficiency, are given a life job.

In their attempts to lower costs and obtain net profits, how far do American executives tend to exclude

outside ideas from their productive program? To what extent do they welcome outside thinking from those whose work and studies cover a field different from their own? Answering this question from the experience of American machine tool manufacturers, we can give the American executive high rating. He is willing to be educated; he is receptive, he has a nose for fresh opportunities; he is prone to look upon his present methods with an eye of suspicion as concealing from him, per chance, some possible profit. "Greater net profits" sounds

Net Profits Statement

The Investment

No. 3-A turret lathe with standard equipment cost.....	\$4,144.00
Second-hand value of turret lathe replaced.....	850.00
Cash, or additional investment, required for machine equipment.....	\$3,294.00
Special equipment cost	161.00
Total cash required	\$3,455.00

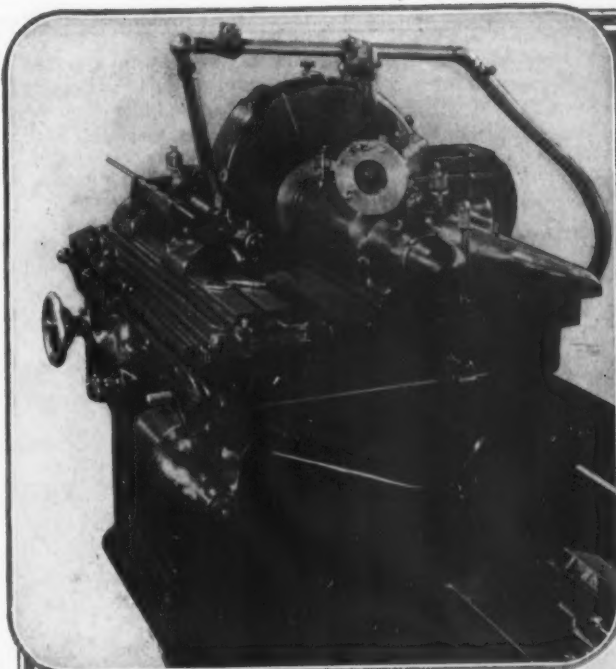
The Gross Profit

Former cost—80 min. \times 2½c. (with direct labor at 60c. and overhead 90c., a total of \$1.50 per hour, or 2½c. per minute).....	\$2.00
Cost with new equipment—30 min. \times 2½c.....	0.75
Gross profit per piece	\$1.25
Production per day using "48-minute hour" to be conservative $\frac{48 \text{ min.} \times 9 \text{ hr.}}{30 \text{ min.}} = 14 \text{ pieces}$	
Gross profit per day—14 pieces \times \$1.25.....	\$17.50
Gross profit per year—\$17.50 \times 280 working days.....	4,900.00

The Net Profit

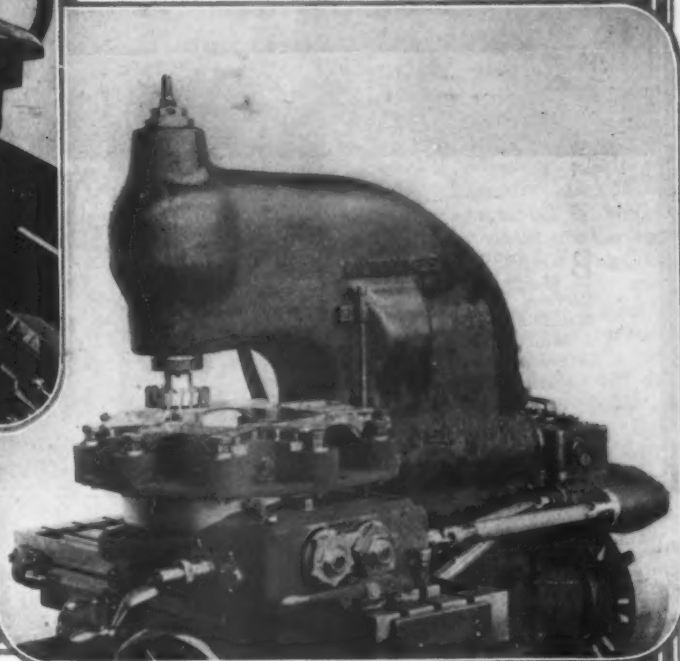
From this gross profit must be taken depreciation as follows:	
20% of added investment in machine and standard tools, or 20% of \$3,294 =	\$658.80
And 100% of special tools.....	161.00
Total	\$819.80
Net profit per year	4,080.20
Net profit on the investment is	
$\frac{\$4,080.20 \text{ (net profit)}}{\$3,455.00 \text{ (added investment)}} = 117.8\%$	

Net Profit on Investment of \$3455.00 is 117.8% per year.

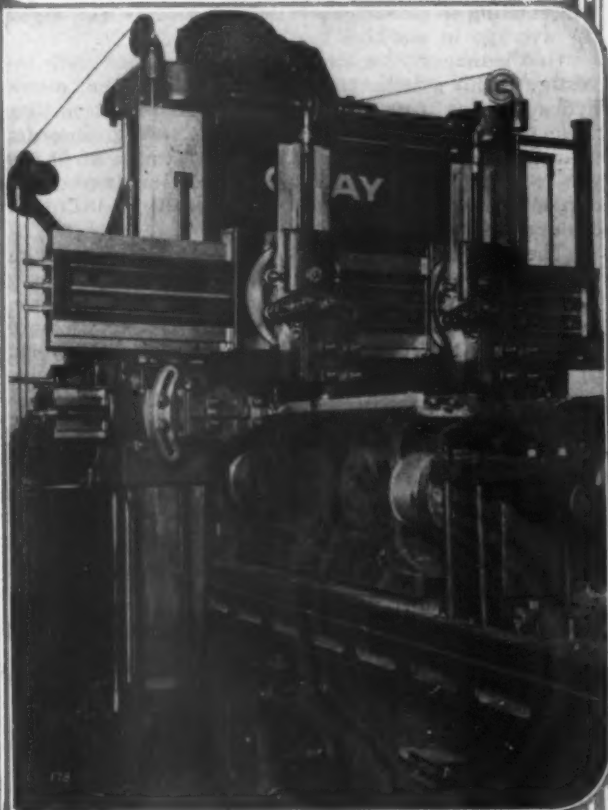


LANDIS Hydraulic Traverse Grinding Machine, Which in Replacing an Older Landis Machine Cut Production Time One-Third and Earned a Net Profit of 182 Per Cent (Above)

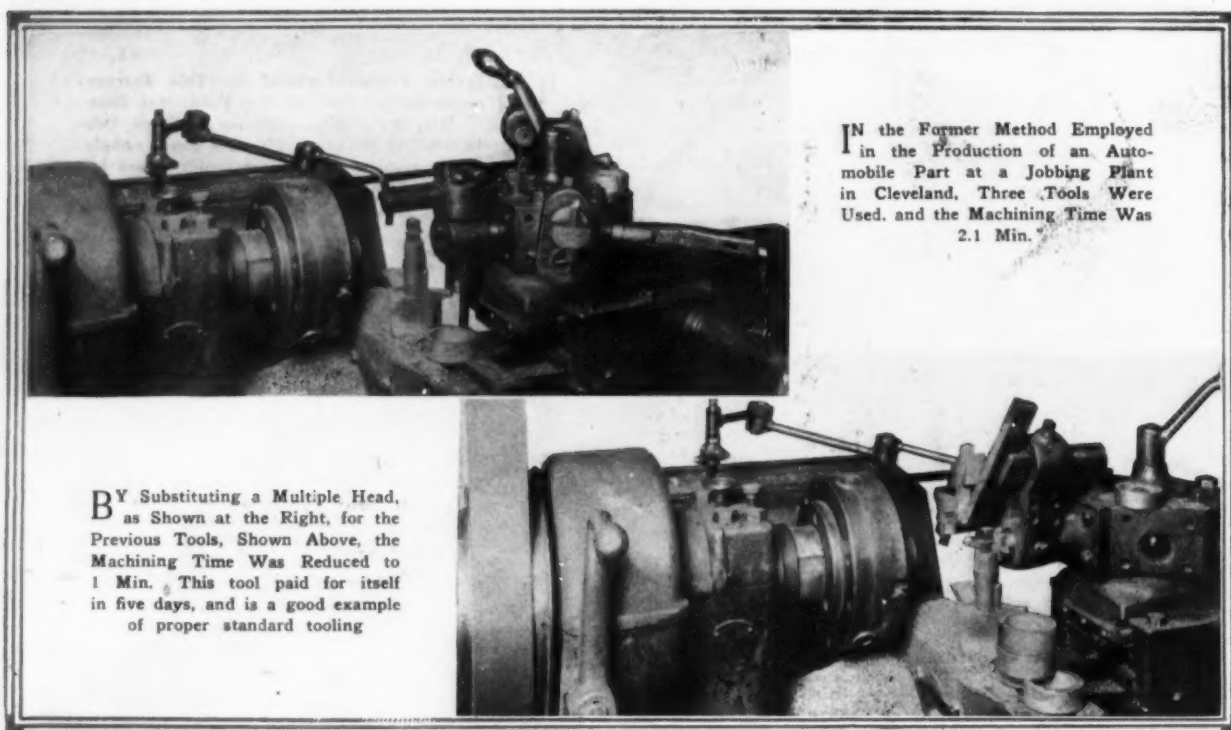
THE Special Fixture Provided for This Kearney & Trecker Milling Machine Cut Production Time From $1\frac{1}{2}$ Min. to $\frac{1}{2}$ Min. The net profit on this investment was 193 per cent. This is a good example of the service machine tool builders render users by adapting standard machines to special purposes



ANDREW CARNEGIE said: "It is surprising how few men appreciate the enormous dividends derivable from investment in their own business. There is scarcely a manufacturer in the world who has not in his works some machinery that should be thrown out and replaced by improved appliances; or who does not for the want of additional machinery or new methods lose more than sufficient to pay the largest dividend obtainable by investment beyond his own domain. And yet most business men whom I have known invest in bank shares and in far-away enterprises, while the true gold mine lies right in their own factories."



THE Substitution of a Modern Planer for an Older Type, Without Change of Method or Tools, Cut Machining Time from 325 Min. to 181 Min.



IN the Former Method Employed in the Production of an Automobile Part at a Jobbing Plant in Cleveland, Three Tools Were Used, and the Machining Time Was 2.1 Min.

BY Substituting a Multiple Head, as Shown at the Right, for the Previous Tools, Shown Above, the Machining Time Was Reduced to 1 Min. This tool paid for itself in five days, and is a good example of proper standard tooling

alluring and he reacts promptly and vigorously to the impact of this idea.

The executive who, for the moment, pockets his natural pride in his own factory and, "with the blinders off," goes through his plant, will find his reward surely and certainly in the net profit column. Production cost can still be reduced and the record of good management is always written in larger figures. The following examples of increased production, expressed in terms of "net profits," are all taken from American plants and illustrate the wide variety of possibilities still existing in plants generally regarded as well above the average in machine tool equipment.

One manager of a large New Hampshire shop investigated his grinder equipment and found that a new hydraulic type of grinder would cut the production time from $1\frac{1}{2}$ min. to $\frac{1}{2}$ min., a two-thirds saving. In order to install the new grinder, a cash investment of \$1,500 was required, but results show that the investment earned a net profit for the year of \$2,724 or 181.6 per cent on the investment.

The possibilities of increased net profits through up-to-date machinery and tools are not confined to any particular kind of work or quantity of manufacture. Sometimes savings arise through installing a more modern type of equipment for a given kind of work. In other cases, a change in the existing type of equipment produces large returns. A well-known manufacturer of motor-driven fire apparatus studied his equipment problem carefully. In the case of some shafts made in lots of only 50, a machine tool producer promised to reduce the present time from 80 min. to 30 min. At first thought the cash expenditure of \$3,455 appeared a tidy sum for one machine and tools. The new machine, however, showed a net profit for the year of \$4,231.21, or a return of 119.4 per cent.

Opportunities In Use of Proper Tool Equipment

Another possibility of increasing production with a modest expenditure of cash lies in the use of the proper tool equipment. The great development of high-speed steel in recent years has made possible much heavier cuts, and the manufacturers of machine tools have been quick to redesign their machines to provide power and rigidity necessary for heavy and multiple cuts. The majority of standard machine tools may now be equipped with tools designed by the manufacturer to cover a wide range of work efficiently and with a low investment.

A good example of this is a jobbing shop in Cleveland which was having difficulty to break even on a run of bushings for a prominent automobile company.

The existing tools consisted of one standard tool manufactured by the maker, and two home-made tools, in all requiring three positions of the turret. An enterprising shop foreman discovered the possibility of substituting one multiple turning head, manufactured by the machine tool maker. This tool took four cuts simultaneously and reduced the time from 2.1 min. to 1.0 min., a saving of more than half. The tool paid for its cost of \$65.60 in five days and was then used for a large variety of work which followed.

The adaptation of standard machines to special purposes provides another opportunity for net profits from modern equipment. The resulting production is high and yet the large expense of entirely special machinery is avoided. If the nature of the work is changed suddenly, the machine may be adapted to other work, changing only the special fixtures.

A case of this kind is a standard milling machine with a special 17-in. rotary table which holds five work pieces and is suitable for several sizes of work. The standard machine method held the piece in a vise, milling one at a time. The special fixture reduced the time from $1\frac{1}{2}$ min. to $\frac{1}{2}$ min., a saving of two-thirds. An investment of this kind is justified only by reasonably high production because the special fixture cost \$1,200 and, of course, must be charged off either in the first year or during the life of the design of the work. In the case of these pads the investment returned 192.9 per cent annually, including writing off the fixture during the year.

Studies of many lines of machine tools show that, on the other hand, large savings are realized on small lots of work because little attention has been given to determining accurately the possibilities of modern equipment in this regard.

Equipment of Many Plants Is "Worked Out"

The majority of plants which are liquidated and sold under the hammer show an amazing assortment of obsolete machinery. Plain milling machines are found where the universal type is absolutely necessary for economical production. Home made turret lathes, awkward and usually inaccurate, are discovered. In general, extremely light construction of engine lathes and planers is found. The fact is that, in a more or less acute degree, many plants in the United States are "worked out," so far as equipment is concerned. In many cases manufacturers and executives do not know that they are oblivious to facts and thus keep down the net profits of their enterprises.

Have we demonstrated that the American metal working executive is getting results commensurate

with his opportunities? We have not undertaken to prove that all executives are up to date, but do we stand a Chinaman's chance of being able to prove it if we tried? And yet the examples of production which have been cited would have been regarded as fantastic a few years ago. New and better ways of performing old operations are continually being developed.

Following Andrew Carnegie's advice, as it is applicable today, the industrial executive who will go through his factory with his plant executive, who will receive suggestions with an open mind and make investments that the experience of others has proved sound, will open the "true gold mine" that lies right in his own factory.

Effect of Consolidations Considered

Witness in Bethlehem Hearings Gives His Views—Hearing Adjourned for Present, but Will Be Resumed

PHILADELPHIA, March 28.—The Bethlehem merger hearings in Philadelphia were concluded on Wednesday of this week. Adjournment was taken at the suggestion of Attorney B. B. Bane for the Federal Trade Commission to "a place and time to be later set, which will be approximately two weeks from the beginning of this coming week."

The last witness at the hearings here was John D. Landis, purchasing agent of the Philadelphia & Reading Railroad Co. He said that he purchased rails mostly from the Bethlehem Steel Co. both before and since it acquired the Midvale Steel & Ordnance Co., and the Lackawanna Steel Co., although small lots had been bought from the Cambria Steel Co. Purchases also were and are made from the Carnegie Steel Co., Mr. Landis said. Other material is bought from various producing companies.

Charles P. Soden, vice-president and treasurer John Illingworth Steel Co., Frankfort, Pa., manufacturer of crucible steel and alloy steel merchant bars, said that he finds it more difficult to buy billets now than before the war. He declared that previous to the war it was possible to contract for three years ahead, but now mills will not make a contract for more than three months. Purchases are made from a number of sources, including the Bethlehem Steel Co.

Replying to a question by Attorney Frederick H. Wood, the witness said the Bethlehem Steel Co. recently took some large accounts from his company because of low prices. He told Mr. Wood that the Bethlehem prices were lower than he could afford to sell at.

Attorney Bane asked Mr. Soden what he had found to be the effect of consolidations in the steel industry.

"The only thing that I can say is that we are in a progressive age and I can only compare the present age with almost ancient history, going back all the years that I have been in the business," said Mr. Soden, "Consolidations mean higher prices, probably more stable prices, elimination of individuality, but it is a condition. That is all I would say about it. * * * * * I cannot condemn it because God knows what we are going to have in the next hundred years. Maybe we have only started."

Mr. Bane urged the witness to supplement his answer as to the effect of consolidations. Mr. Soden declared that when the United States Steel Corporation was organized prices were very low but since its formation have probably advanced 100 per cent. He said, however, he believed the Crucible Steel Co., since its consolidation, had reduced prices. The Steel Corporation, it was stated, has undoubtedly made prices more stable. The witness said he did not know anything about what the policy of the Bethlehem Steel Corporation will be.

Milton Ray Mackell, assistant purchasing agent of Morris-Wheeler Co., Inc., Philadelphia, iron and steel jobber, formerly associated with the Cambria Steel Co., and the Midvale Steel & Ordnance Co., was questioned about competition between these companies and other producing interests, including the Bethlehem Steel Co., and expressed the opinion that it applied principally to shapes made by Cambria. Barton Hoopes, Jr., manufacturer's agent in Philadelphia, formerly vice-president of Hoopes & Townsend Co., manufacturer of bolts, nuts, rivets and iron and steel bars, told of purchases and sales made by that company when he was associated with it.

William Henry Courtright, purchasing agent for William & Harvey Rolland, Inc., manufacturer of automobile leaf springs, said that material is bought from Bethlehem in large quantities, while smaller tonnages had been bought from the Cambria Steel Co. before it was acquired by Bethlehem, and also were and are purchased from other producers. Milton S. Hager, vice-president, secretary and assistant treasurer Penn Seaboard Steel Corporation, and secretary and assistant treasurer Tacony Steel Co., said that the disarmament conference had made it unprofitable to operate the plant of the Tacony Ordnance Co., built during the war.

Elimination of Varieties of Sheet Metal Considered

WASHINGTON, March 31.—Consideration of elimination of hundreds of varieties of sheet metal ware has been taken up by that industry, according to an announcement by the Division of Simplified Practice, Department of Commerce. Meetings of committees selected for this purpose were held in connection with sessions of the Sheet Metal Ware Association last week at the offices of the Chamber of Commerce of the United States. Conferences were also held with representatives of the Federal Specifications Board and the Bureau of Standards.

The studies of simplification possibilities are being taken up in three divisions, one being devoted to enameled ware, one to black iron and galvanized ware and one to tin ware. The first is headed by W. Topping of the Columbian Enameling & Stamping Co., Terre Haute, Ind. Fenton Lawson of the F. H. Lawson Co., Cincinnati, is head of the second group, and E. M. Blake of the Central Stamping Co., New York, is head of the tinware committee.

Prize for Foundry Devices

The S. Obermayer prize of the American Foundrymen's Association will again be awarded at the 1925 convention and exhibition in Syracuse, Oct. 5 to 9, for any device which shall be developed for the purpose of increasing the production of castings and facilitating the handling of equipment. The association announces its wish that every member call attention to this competition in order to bring out as many good ideas as possible. Any jig, piece of equipment, or description of a method that can be used in molding, core making, casting or in handling operations will be accepted.

The C. F. Pease Co., 813 North Franklin Street, Chicago, manufacturer of blue printing machines, is offering a prize of \$100 to the person who submits the slogan best adapted for promoting the use of blue prints accompanied by the best explanatory letter. The contest is open to everyone.

A daily exhibit of modern motor driven machine tools all under power will be given by the Motch & Merryweather Machinery Co. in its demonstrating room 130 Seventh Street, Pittsburgh, from April 17 to 25.

IMPROVED JIG BORING MACHINE

Column Made Heavier and Spindle Gear Box More Compact—Measuring Devices Simplified

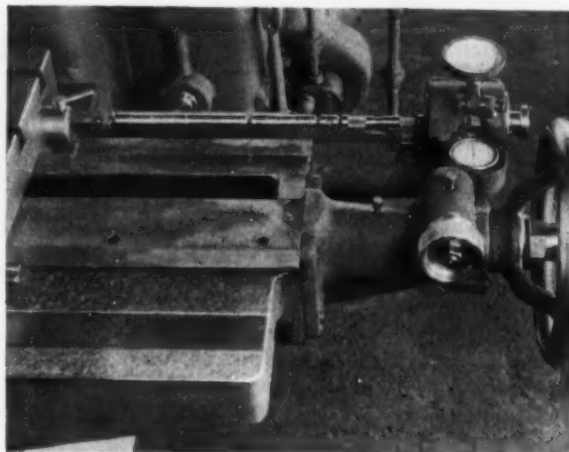
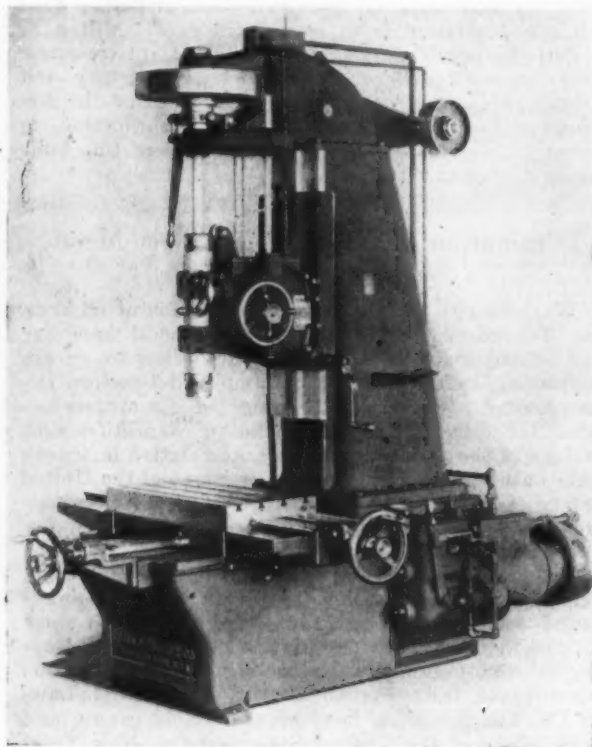
Improvements recently made in the jig boring machine of the Pratt & Whitney Co., Hartford, include a heavier column, a redesigned spindle speed gear box, and larger spindle head. The measuring devices for the transverse and longitudinal movements of the table have been strengthened and also simplified. Although particularly adapted for the very precise work of making jigs, the machine may be used also for a variety of other tool-room work requiring close accuracy.

The new and heavier column is intended to withstand vibrational strains and to provide the rigidity necessary for accurate boring. The column head has

tion, by means of which the entire spindle head is locked in position, while the quill furnishes the vertical feed motion, is stressed as facilitating very close accuracy.

The table of the machine measures 16 x 30 in., and is accurately scraped on the top and four sides to exact alinement with the column and spindle. The table is equipped with transverse and longitudinal slides, each of which are traversed by a screw equipped with both a slow motion and a rapid traverse handwheel.

The measuring device for each slide consists of a combination of end measures, an inside micrometer and an indicator dial. The end measures give even inches, the inside micrometer gives thousandths of an inch, while the indicator dial provides for ten-thousandths of an inch. After having set the spindle of the machine over the first hole to be bored, either by means of a proving bar or a "button," it is a simple



The Heavier Column Adds to the Rigidity Necessary for the Closely Accurate Boring Required of the Machine. The column head has been made changed and the spindle head made larger and given greater bearing surface on the column face. The measuring devices for the transverse and longitudinal movements of the table, a detail of which is shown above, have been strengthened and slightly simplified

been changed to conform to the new column, these two changes improving the appearance of the machine as well as providing additional mechanical advantages. The spindle speed gear box has been made smaller and more compact, adding to the strength of the drive and reducing the floor space occupied by the machine. The spindle head has been made larger and heavier and has greater bearing surface on the face of the column.

The machine is intentionally equipped with belt drive to the spindle in order to limit the power available, so that the accuracy of the machine cannot be affected by the heavy strains caused by careless handling or overloading. The drive may be by belt from a countershaft or by belt from a motor mounted on the side of the head. In either case, the drive is to a pair of tight and loose pulleys on the rear of the gear box. From the speed gear box the drive is to a large pulley on the rear of the bed, and from there to the spindle pulley by means of a belt running over two idlers. The spindle pulley is equipped with a hand-operated friction clutch which controls the power to the spindle and spindle quill. Power is taken from the spindle to drive the spindle gear box which is contained in the spindle head.

Speeds and feeds may be set by convenient levers on the two gear boxes and the spindle may be fed either by hand or power. The spindle quill construc-

tion, by means of which the entire spindle head is locked in position, while the quill furnishes the vertical feed motion, is stressed as facilitating very close accuracy.

Eight spindle speeds, ranging from 22.2 to 300 r.p.m. are provided and the feed gear box gives four feeds ranging from 0.0025 in. to 0.010 in. per revolution of the spindle. The longitudinal table traverse is 24 in., and the transverse travel 18 in. The floor space occupied by the machine is 5 ft. 10 in. x 7 ft. 1 in. The height is 8 ft. 10½ in.

Shipments of steel furniture in February are reported by the Department of Commerce at \$1,556,937, being lower than the \$1,653,284 in January or the \$1,605,409 in February, 1924. Except for January and December, however, the present figure is the highest since last April.

The Delaware River Joint Bridge Commission, Widener Building, Philadelphia, will open bids April 15 on 360 net tons of steel reinforcing trusses for the roadway of the Delaware River bridge. These trusses are to be of medium steel, 4½ in. in depth and 30 ft. 2 in. in length. There will be 23,880 of them.

The Coming Conflict in Foreign Trade

American Manufacturers, in Strong Position, Have Made
Heavy Gains in Past Decade—Long-Term Credits,
Properly Administered, a Factor

BY JULIUS KLEIN*

STEADILY advancing prosperity and growth of productive capacity within the United States are among the best indices of our competitive powers in international commerce. We hear much of mass production and of its vast powers in determining competitive ability, but we do not always realize the tremendous advantage which the United States actually has in this connection. Our manufactures were valued at about \$25,000,000,000 in 1914; their value in the recent census of 1923 was indicated at approximately \$60,000,000,000—a most impressive increase, even after allowance is made for liberal price changes during the decade.

In pig iron, for example, the gross tonnage produced by the United States in 1913 was 30,600,000, which was practically the same as the combined output of the United Kingdom and Germany, at 29,300,000 tons. By 1924 this predominance had been almost doubled; that is to say, the American output was 31,000,000 tons, whereas the combined British and German output was only 15,600,000 tons. A similar situation prevailed in steel ingots, in which the American production in 1913 was some 31,300,000 tons, against the British and German combined total of slightly in excess of 26,000,000 tons. By 1924, however, the American production had risen to 37,800,000 tons, whereas the production of our two European rivals was slightly under 17,000,000 tons.

On the side of coal production, likewise, we have more than maintained our pre-war supremacy, having reached more than 573,000,000 tons in 1924, or considerably in excess of the combined output of the United Kingdom and Germany. Our consumption of the world's crude rubber production, to take another index of industrial expansion, has arisen from 43 per cent of the total world output in 1913 to 77 per cent of a much greater output in 1924. Similar figures might be cited in many lines to indicate the truly impressive predominance of industrial America, a mastery which is bound to determine ultimately the direction of the world's commerce.

Quality Goods to Prevail Against Cut Prices

Fundamentally, the issue between the American exporter and his rival would seem to be one strictly of whether quality or cut prices should prevail. As between the two there is to be no question as to the ultimate decision of the American merchant or manufacturer. A strict adherence to those high standards which have long given American wares their standing in overseas markets would seem to be the best and, in fact, the only foundation for a lasting edifice in our foreign trade. It is probable that this may mean a loss in certain lines and trade centers, but there is some comfort in noting that European price cutting seems to be decidedly on the wane for several strong reasons.

First of all, the high rates of interest now being required by all lenders of capital, whether native or American, to European enterprises will present an increasingly serious problem for the European manufacturer. Secondly, he faces the inevitable accumulation of heavy taxes, from which relief might not be available for years. Thirdly, there is every indication of a steady upward climb of wage rates which in Germany, for example, are still 25 per cent below pre-war purchasing power. Fourthly, with recovering exchange

rates, as a result of stabilized currencies, one of the monetary advantages enjoyed by our competitors after the war is being wiped out.

There can be no doubt that recovering European industries are in need of capital, but it can be frankly questioned how much of the amounts sought are desired for legitimate purposes and how much as a means of satisfying the obsession for excessive long credit terms to their customers, so conspicuous a feature of pre-war Continental, and particularly German, exporting. One of the grim truths which our German competitors ought to have learned as a result of their experiences in 1912-13 was the extremely unstable position which inevitably results from overextensions of credit. The first tremor of international difficulties in the Balkans and in Tripoli at that time was enough to send a quaver through many German overseas operations, because of the precarious inflated credits upon which they were based. It might well behoove those responsible for the supply of capital to the revival of Continental industry to scrutinize closely the precise character and stability of the overseas operations made possible by such extensions of capital.

Administration of Long-Term Credits

Long-term credits have a well recognized place in all business, whether export or domestic. The difficulty lies in their proper administration; and in this field it might be well to dispose of the absurd fiction that American firms are amateurs in the matter of proper credit extension. For nearly two decades all sober minded and well-informed European exporters have admitted the superiority of long-time credit systems of such well-known American lines as agricultural implements, sewing machines, etc. If Germany proposes to resort to such dangerous short-cuts to temporary export inflation as excessive credits, or prolonged price reduction, she will be building a house of cards which will collapse at the first flutter of international uncertainties.

Let us leave the extraordinary risks of price-gambling to our competitors and adhere to those sound principles which have always been the basis of successful merchandising at home and abroad—good quality, just terms, implicit compliance with commitments on delivery, and development of the best production technique. Let us, above all, keep our heads and not be stampeded by any sudden or momentary shift in the trade current or by temporary advantages of our competitors.

A useful chart on copper and its alloys has been prepared by Charles H. Hughes, 2681 Amboy Road, New Dorp, Staten Island, N. Y. It is logically arranged for ready reference, having three wide vertical columns headed, copper, alloys and tables. Under "copper" there are paragraphs on copper ores, methods of extracting copper, the grades, commercial forms, physical, chemical and electrical properties, etc. The column designated "alloys" contains chemical proportions and properties of alloys such as Admiralty bronze, aluminum bronze, Babbitt, brass, Muntz metal and many others. Under the column "tables" are data on copper and brass sheets, pipes, tubes, comparison of gages, etc. The chart, printed on bond paper, 17 x 22 in., is available at \$1 per copy including postage. It can also be secured printed on cardboard for \$1.25, suitable for hanging on the wall.

*Director United States Bureau of Foreign and Domestic Commerce. This is the concluding portion of an address made before the American Manufacturers' Export Association, New York, March 25.

Skilled Labor Coming to the United States from England

WASHINGTON, March 31.—Industrialists and economists alike are studying the streams of emigration of skilled labor from England, their source, destination, and the causes of their movement, which are a matter of grave concern to British observers, according to T. R. Wilson, of the European Division of the Department of Commerce. A close study of the composition of the streams of emigrants shows that over 50 per cent of them are young men and women between the ages of 18 and 30. The United States was the leading destination in 1923 for all classes except agricultural. Of this class 16,898 went to British North America. Of the 52,533 skilled workers departing in 1923, the report says, 28,827 came to the United States. Undoubtedly, the increase would have been greater had it not been for the restrictions provided by the American immigration law. One of the main reasons for the exodus of skilled workers is the disturbed and unsettled industrial situation, particularly in the engineering and building trades, coupled with the high proportion of unemployment.

Employers Will Hear Lecture of Dr. Dyer by Radio

INDIANAPOLIS, March 30.—Dr. Gus W. Dyer, head of the department of social service and political economy at Vanderbilt University, Nashville, Tenn., will speak at a meeting to be held here April 2 under the joint auspices of the Indianapolis Foundrymen's Association, the Indiana Manufacturers' Association, the Associated Employers of Indianapolis and the Indianapolis Branch, National Metal Trades Association at the annual meeting of the latter organization. Dr. Dyer will speak on "Economic Effects of Industrial Relations." The meeting will be held at the Shortridge high school building and the public has been invited.

Arrangements have been made by A. J. Allen, secretary of the Indianapolis Foundrymen's Association, to broadcast the speech by radio. Bulletins have been sent to a number of cities in the Middle West urging employers to "tune in" on the speech on station WFBM Indianapolis. Replies have been received from a number of industrial associations saying that they had notified their membership of the program.

Standardization of Cast Iron Pipe

Representatives of the sponsor body for the standardization of cast iron pipe (the American Water Works Association, the American Gas Association and the American Society for Testing Materials) held a meeting recently to arrive at a plan for representation on the sectional committee and to get the work under way. The importance of standardization of materials was one of the matters to which the representatives at the meeting gave special consideration. On account of the lack of definite organization of the producers of cast iron pipe, the matter of representation of such producers at the sectional committee presents some difficulties, and this matter is one of the topics that conferees have taken under consideration pending their next meeting.

Ruling on Rates to Southern Points

WASHINGTON, March 24.—Passing upon the complaint of the Traffic Bureau of Nashville, Tenn., Examiner R. N. Frezise has recommended to the Interstate Commerce Commission that it find the rate of 26c. per 100 lb. on iron and steel articles in carloads from Birmingham, Ala., to Nashville, is not unreasonable but is unduly prejudicial to the advantage of Chattanooga and Knoxville, Tenn. The examiner held that the rate of 26c. should be found unduly prejudicial to Nashville to the extent that it exceeds 3c. per 100 lb. more than the contemporaneous rate on like traffic from Birmingham to Chattanooga, and 4c. less than from Birmingham to Knoxville.

Serious Competition from German Manufacturers of Methanol

Manufacturers of charcoal pig iron are being confronted with a serious economic problem because of the foreign competition that has developed against their principal by-product, methanol, better known as wood alcohol, which is now being produced in Germany and Sweden by a synthetic process, by which it is said that a practically pure methanol is being made at a cost 87 per cent less than that of the average process based on the destructive distillation of wood. Methanol is distilled before the wood is converted into charcoal for use in charcoal blast furnaces, and has been a profitable by-product for operators of charcoal furnaces.

The new process of synthesizing methanol is reported to have originated in Sweden, but the greatest commercial development is in Germany. A number of shipments, estimated at 90,000 tons, have come into the United States since the first of the year. It is stated that importers are offering the imported methanol at approximately 10c. per gal. below the price of the domestic product, which is around 48c. per gal. The duty on methanol is 12c. per gal. Were this increased the full 50 per cent permissible under the flexible tariff provision, it is declared that the additional duty would fall far short of offsetting the 87 per cent difference in the cost of production. However, efforts will be made to secure an increase in the tariff and this matter has been placed in the hands of a committee of wood chemical engineers. This committee has little hope of securing early action because it is stated that, out of 1500 applications for tariff readjustments made last year, only about 200 were reached for hearing.

Planer Builder to Erect New Plant

The G. A. Gray Co., Cincinnati, will shortly begin the erection of a new plant which will be one of the largest in the world devoted exclusively to the manufacture of planers. It will be located on a seven-acre tract in Evanston, a part of Cincinnati lying north of the center of town, between Walnut Hills and Norwood. It will be on the Cincinnati, Lebanon & Northern division of the Pennsylvania Railroad.

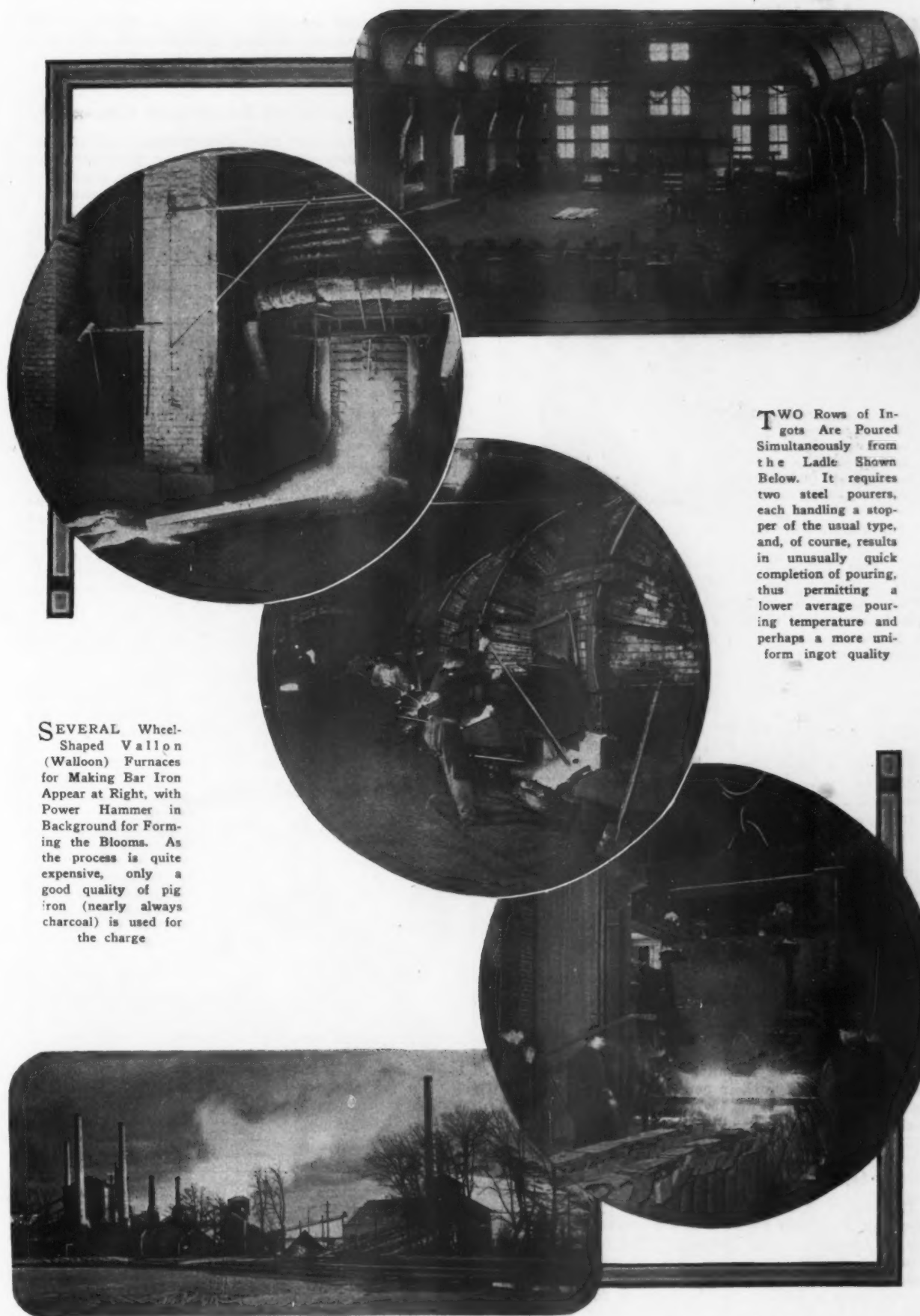
The plant will consist of a steel frame building with walls of steel sash and glass, 420 ft. long along the railroad and 210 ft. along Woodburn Avenue. The main bay, which will run parallel to the railroad, will be 60 ft. wide. Adjoining and parallel to this bay is a second one of the same length and 50 ft. wide. Alternate high and low side bays, 100 ft. long and 40 ft. wide, run at right angles to the main bays. The north wall will be of glass 420 ft. long and 22 ft. high. The construction will be such that every part of the building will have daylight.

The main bays will be served by two 20-ton, 3-motor cranes, with a clearance of 25 ft. under the crane hook. The adjoining bay will have a 15-ton crane with 19 ft. clearance. The side bays will have 3-ton cranes. Space will be reserved for the foundry, which will not be moved from its present location until the new machine shop is in operation.

The company's office will be housed in a two-story brick building at the eastern end of the shop. The engineering and production departments will occupy the second floor, while the sales, accounting and administrative offices will be on the first floor.

The Austin Co., Cleveland, will be in charge of the construction of the new plant which is expected to be in operation early in the fall.

The McWane Cast Iron Pipe Co., Birmingham, Ala., is shipping 10 miles of precalked joint 6-in. pipe for water mains to West Palm Beach, Fla., 24- and 6-in. pipe for Coral Gables, near Miami, 21,000 ft. of 2-in. pipe to Highland, Ill., and 16,000 ft. to Fredericktown, Md. This company is also completing an order for 10 miles of 6-in. precalked joint pipe to Mauri, Hawaii, and tonnages to Cortland, N. Y.; Chester, Pa.; Meadham, Mass., and Gallup, Mexico. Its addition to the plant will be completed by May 1 and it will add 200 men to its working forces.



SEVERAL Wheel-Shaped Vallon (Walloon) Furnaces for Making Bar Iron Appear at Right, with Power Hammer in Background for Forming the Blooms. As the process is quite expensive, only a good quality of pig iron (nearly always charcoal) is used for the charge

TWO Rows of Ingots Are Poured Simultaneously from the Ladle Shown Below. It requires two steel pourers, each handling a stopper of the usual type, and, of course, results in unusually quick completion of pouring, thus permitting a lower average pouring temperature and perhaps a more uniform ingot quality

Swedish Iron and Steel Plant

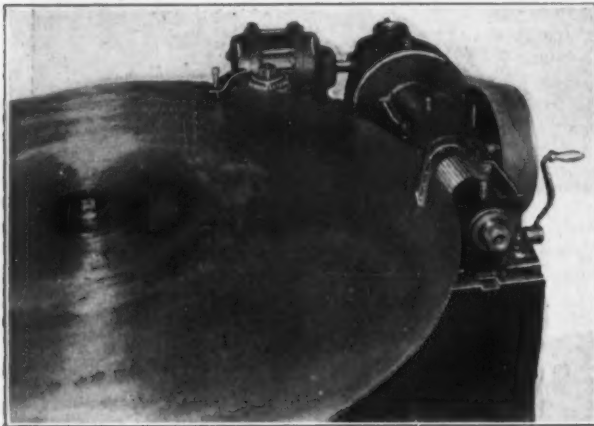
FIVE photographs grouped above show some of the operations of the Gimo-Osterby Co., in the province of Upland, a few miles north of Stockholm, Sweden. The iron works at this point have been in operation since 1335. Among the photographs particular points of interest are covered in the double pouring of open-hearth steel from a ladle which has two nozzles and two stoppers; the run of iron from a small blast furnace, in which the photo-

graph shows the arrangement of bustle pipe; the peculiarly shaped Vallon forge furnace for bar iron, operated by one man to each furnace; the unusual structural arrangement in the rolling mill building, where deep concrete arches are carried across from wall to wall to support the roof, while the crane rails are carried on projections of concrete columns. A general view of the smelter at Gimo is given in one picture. Under normal conditions the company has an annual output of about 18,000 tons of ingots, 4500 tons of Vallon iron, 2000 tons of crucible steel and 12,000 tons of rolled and forged steel.

Machine for Reconditioning Friction Saw Blades

A machine intended to facilitate the sharpening of friction saw blades, reducing the cost of reconditioning and renewing the blade, so to speak, is shown in the accompanying illustration.

The usual method of sharpening such blades is by forming teeth in the periphery with a hammer and cold



The Hob Revolves the Blade and Mills the Grooves

chisel. This, it is claimed, seldom produces a blade that is nicked uniformly and to proper size, the metal being merely displaced by the chisel, widening the rim, which tends to increase the power required for cutting and also to increase the amount of waste on each cut. With a mushroom edge there is considerable chipping and burrs are often left on the work. It is also pointed out that with the hammer and chisel method the blades sometimes fail in service because the nicking often causes small cracks between the teeth. To overcome the difficulties cited, and also to reduce the cost of reconditioning is the purpose of the machine illustrated, which has been placed on the market by Joseph T. Ryerson & Son, Inc., Chicago.

In this machine a centering and leveling frame holds the blade in a horizontal position. The milling and serrating hob, shown at the right, revolves the blade and at the same time mills the grooves, trimming the rim of the saw so that the periphery is left true. At another point on the circumference of the blade a pair of milling cutters remove the slight mushroom effect from both sides of the blade. The cutting is rapid and the teeth are spaced evenly at the proper angle to the radius of the blade, and it is claimed that they have the same strength and resistance as those on a new blade. Ease of operation is a feature of the machine, it being designed for operation by unskilled workmen.

The machines are installed in each of the seven Ryerson plants where their performance may be seen. The company also intends to recondition friction saws, for those having only occasional work of this kind.

Operations of Ohio Foundries

The report of the Ohio State Foundrymen's Association for February shows a slight increase in operations as compared with January. The percentage of operations in February was 71.4 of capacity while January was 70.7 and February, 1924, 74.1. Stocks received show a decline, the percentage for February being 57.8, for January, 72, and February, one year ago, 60. Stocks on hand are higher than at any time in many months, being 106 per cent, as compared with 94 per cent in January and 78 per cent in February, 1924. The continued increase of stocks on hand from month to month for the past three months indicates that business has not increased to the extent that many of the members had expected.

At a meeting of the board of administration of the association held in Toledo, March 19, safety work was considered at length and renewed efforts will be made by the members to promote safety. It was decided to

hold the annual meeting at Cedar Point, Ohio, the latter part of August or early in September. The next meeting of the board will be held in Dayton.

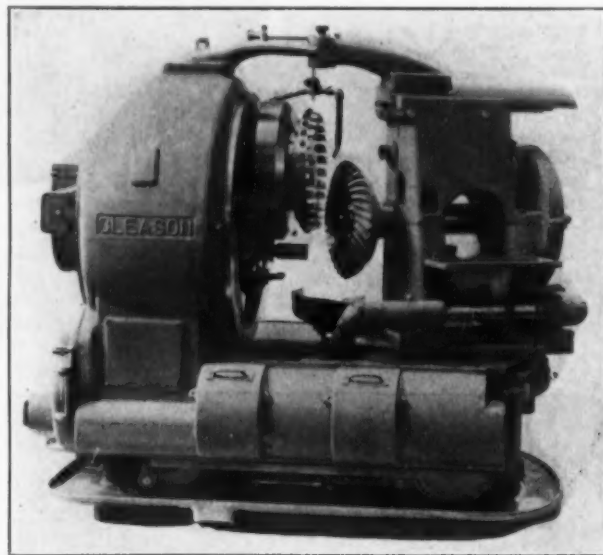
New Gleason Spiral Bevel Gear Generator

A spiral bevel gear generator rated as a 25-in. machine but capable of handling larger diameters has been added to the line of the Gleason Works, Rochester, N. Y. The machine is intended for cutting gears or pinions having a cone distance of not over 16½ in., which permits the gears of 8 to 1 ratio combination to be 32¼ in. in diameter and those of 3 to 1 ratio, 31.2 in., those of the 2 to 1 ratio, 29.5 in. pitch diameters. The largest pitch for which the machine is recommended is 1½ d.p.

It will be noted from the illustration that the machine is equipped with an overhead tie for bracing the cutter and the work together. The cutter is set in the cradle running in an entirely inclosed housing. This construction is stressed as providing maximum rigidity, and it is claimed that in roughing out cast-steel miter gears of ½ d.p. full depth 4-in. face, a speed of 1 min. 50 sec. per tooth was obtained with a cutter of 0.400 in. point width, without distress to the machine.

The indexing mechanism, which is of the stop-wheel type, is also a feature stressed. The index change gears are placed in the constantly moving train of gearing that drives the generating movements of the machine. There are no dead gears in the generating train and close accuracy of indexing and tooth profile are obtained. In the design of the cutter spindle, which is another feature, the adjustment for end play and radial play can be made independently and without dismantling the spindle.

The generating roll ratio is obtained by means of change gears, the ends of the train being worm wheels. These worm wheels are split into two pieces and are hobbled by the Whitworth method in which the hob



Spiral Bevel Gears or Pinions Having a Cone Distance of Not Over 16½ In. May Be Cut

drives the wheel and the errors are continually halved by changing the relative positions of the two sides of the wheel and rehobbing until there is no mismatching of the teeth when a shift is made.

Cutters of 18, 12 and 9 in. diameter can be used. Lubrication is effected on the cutter head by a unit system, which provides for all points except the spindle bearings. The latter have their own self-contained system which is intended to safeguard against the entrance of foreign matter into these bearings. A separate system provides for all points requiring lubrication from the work spindle. Arrangement is made for ample supply of coolant to the work.

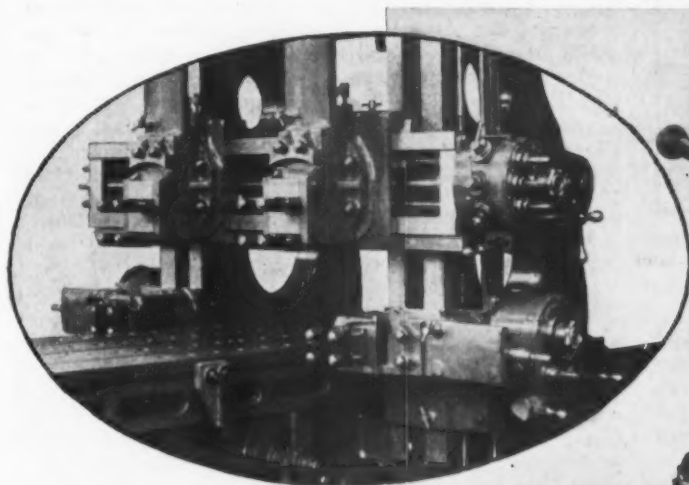
The machine can be arranged for either belt or motor drive, a 7½-hp. constant-speed motor being used for the latter. The machine weighs 14,000 lb. net.

HIGH PRODUCTION PLANER

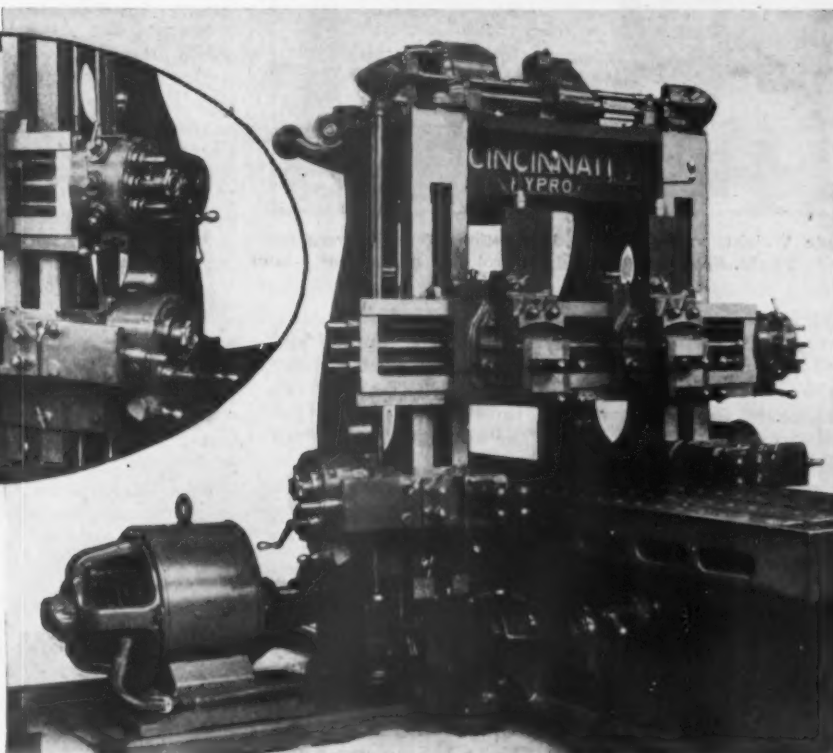
Selective Dial Feed to Heads and Single Turn Rail Clamp Among Features

Improvements intended to permit of material increase in production have been incorporated in the new Hyro planer of the Cincinnati Planer Co., Cincinnati, which is available in sizes from 36 in. heavy to 72 in. standard.

Selective dial feeds are provided for all heads. They are graduated in sixty-fourths of an inch and are arranged so that any feed up to 1 in. can be set instantly from the operating position and read from the front of the machine. Each rail and side head has separate feed, and safety-stop levers are provided on the rail heads so that in feeding the heads toward each other, movement beyond the limit of head travel is automatically stopped, thus preventing damage.



The Planer Arranged With Direct-Reversing Motor Drive, on the Side Opposite the Operator, Is Shown at the Right. The arrangement of operating controls may be noted from the insert above



Another feature is the single-turn rail clamping device employed, in which one turn of a detachable crank handle located at the end of the cross rail serves to clamp the rail securely to the inside face of the planer housing. The rail-clamping mechanism automatically engages the elevating gear when the rail is released, and when the rail is clamped this connection is broken and the elevating mechanism becomes inoperative. Automatic stops limit the maximum travel of the rail.

Power rapid traverse is arranged so that by one movement, either one or both rail heads may be moved across the rail and the tool slides up or down at the same time. Any of these movements may be obtained independently and instantly. The rapid traverse of both side heads is independent of the rail heads. A slip clutch is employed to prevent damage that might otherwise be caused when the heads are run together or beyond their limit of travel. The levers for operating the rapid traverse, rail clamp, rail lift and feed adjustment are placed so that the operator does not have to change his position to reach any of them.

The bed is fully inclosed and its length is double that of the table, so that even at the maximum stroke the table does not overhang. The bed and table are of a box construction and are ribbed in both directions. The bed is provided with inner guides between the Vees on each side to absorb the side strains caused by heavy cuts, and to prevent the table lifting from the Vees. Openings are machined at short intervals in the bottom

of the tee-slots so that chips can fall through, thus keeping the slots free of chips and ready for the insertion of clamp bolts.

The housings have wide faces and are designed so that the heavy thrust of the side-head tools is taken on a square section with metal-to-metal contact. To add to the rigidity, the housings are tied together at the top by a box-type arch. All slides have the dovetail inverted, which is intended to provide a heavier cross-section through the center. This design also causes the dovetail bearing to become tighter under pressure. Taper gibs are employed on all sliding surfaces.

All gears, including the table rack, are of steel, and herringbone gears are used in the drive. All gears in the bed revolve with their shafts, which, in turn, rotate in ground bearings.

The continuous lubrication of the various moving parts of the machine has received special attention. Oil is pumped from a drain tank in the bed through a

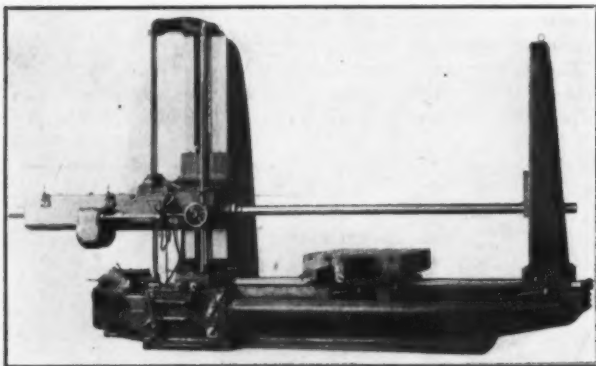
strainer and then through a filter to the various parts. The oil is forced into the Vees near the center of the bed and distributed through channels the full length of the table. Excess oil forms a head in the Vees in the front of the table, flushing out small particles of grit and dirt into the strainer at the end of the bed, thus washing the Vees clean at each stroke. Filtered oil flows constantly to the large chambers surrounding the drive bearings, and before this oil reaches the running bearing, it is filtered again through felt wicks. A stream of filtered oil is sprayed over the teeth of drive gears, a method which keeps the gears above the oil pan and prevents disturbing the sediment at the bottom of the pan. Centralized oil distributors which hold a ten-day supply have been provided on each side head, on the elevating mechanism, at the end of the rail, and on the rail heads. The distributors on the latter lubricate the sliding surfaces as well as revolving parts, and the oil in reaching the sliding surfaces in the center, tends to keep out dirt and thus assure longer life to those parts.

Working parts are accessible for inspection, and sub-assembly units may be removed without interfering with other units. A safety locking feature incorporated in the table control to hold it in neutral, and the company's Tu-Speed belt drive are other refinements. The two speed belt-drive provides two different cutting speeds with constant-speed return, the change from one to the other being made while the machine is in motion by moving the shifter handle.

New Horizontal Boring, Milling and Drilling Machine

The new horizontal boring, milling, drilling and tapping machine here illustrated is a recent addition to the line of the Defiance Machine Works, Defiance, Ohio. It is designated as the No. 6 and is designed to cover a larger range of work than the company's previous standard horizontal boring machines.

The machine is of massive construction to give ample weight and strength to the base and column. The base is provided with outboard supports which carry hardened steel track on which rollers under each end of the platen ride to support the overhang, this



Ample Weight, and Centralized Location of All Levers for Feeds, Speeds and Hand Control Are Features

being one of the special features of the new machine. Centralized location of all levers for feeds, speeds and hand control is a feature. One lever controls the drive of the main boring spindle in either direction, and the machine is equipped with an interlocking device for quick travel and power feed. The spindles on the feed and speed boxes run in roller bearings. The gears in the head feed and speed boxes are entirely inclosed and run in oil, a continuous gravity oiling system being provided. The head, feed and speed boxes are of the unit type of construction.

The principal dimensions and specifications are as follows: Diameter of spindle, 4½ in.; Morse taper No. 6; travel of spindle, 60 in.; distance from face of spindle sleeve to face of tail block, 9 ft. 6 in.; distance from center of spindle to top of platen, 60 in.; distance from center of spindle to top of bed, 70½ in.; vertical adjustment of spindle head, 60 in.; number of speed changes, 10; range of speeds, 7½ to 157 r.p.m.; number of feed changes for spindle, spindle head, saddle or platen, 12; range of feeds per revolution of spindle, 0.004 to 5 in.; dimensions of boring bar regularly furnished, 4 by 92 in.; working surface of platen, 36 by 64 in.; cross feed to platen, 64 in. The machine weighs 30,000 lb. net, and its recommended drive is a 10 hp. motor with a speed range of 900 to 1200 r.p.m.

Growth of Group Insurance

It is pointed out by the Metropolitan Life Insurance Co., New York, that group insurance in force in the United States and Canada, comprising largely the insurance issued against employees of a manufacturing company, now exceeds \$3,000,000,000. The figure has approximately doubled in the past five years and shows an accelerating growth. It has been found in many instances to play an important part in helping to establish a better relationship between management and employees.

Fire, believed to have been caused by a spark from a locomotive, March 28, destroyed the plant and equipment of the Lake Erie Foundry Co., Girard, Pa., with a loss of \$75,000. The plant was occupied by the foundry company, the Girard Model Works and the Girard Steel Stamping Co. Plans for rebuilding are reported under consideration.

Machinery Exports to Germany Climbing to Pre-War Figures

WASHINGTON, March 17.—American machinery exports to Germany took a decided upward trend during 1924, when their valuation, according to the Machinery Division of the Department of Commerce, reached \$2,576,006, as compared with \$763,553 for 1923, an increase of more than 225 per cent. The greatest increase occurred in sewing machines for industrial use, comparative figures for the two years in question being \$110,552 and \$850,000. Metal-working machinery exports, next in importance in this respect, increased during the same time from \$209,474 to \$545,315.

In 1913 Germany purchased more than \$5,250,000 worth of American machinery. This was an increase of about 65 per cent over 1910 figures. Machinery exports from the United States to Germany have declined far under that figure in post-war years, however, averaging about \$600,000 in 1919, 1921 and 1922. In 1921 Germany ranked thirty-first among world countries as a market for American machinery, rising to twenty-third place in 1922, and twenty-fifth in 1923.

Increases occurred in exports of practically every item in the metal-working machinery group. Exports of gear cutters gained over 200 per cent last year. Shipments of sharpening and grinding machinery increased from \$24,000 worth in 1923 to over \$240,000 last year. American exports of lathes increased from \$2,500 worth in 1923 to nearly \$11,000 in 1924; shipments of boring and drilling machines increased from practically nothing in 1923 to nearly \$10,000 in 1924.

Although the gain of approximately 150 per cent in our exports of metal-working machinery to Germany in 1924 is a highly satisfactory showing, Germany is still not buying one-quarter of her pre-war machine tool purchases. An annual average of United States exports of metal-working machinery to Germany for five years, from 1909 to 1913, inclusive, amounted to \$2,280,000. This is a fair indication of the potentialities of the German market from the standpoint of the American machinery manufacturer and takes on new interest in view of the recent increase in demand for machine tools experienced in 1924.

Fabricated Steel Plate Bookings

February bookings of fabricated steel plate are reported by the Department of Commerce at 20,795 tons, compared with 26,859 tons in January and with 15,787 tons in February, 1924. The current figures, with the exception of last September, are the lowest since last April. They include 3321 tons for oil storage tanks, 1125 tons for refinery materials and equipment, 4238 tons for tank cars, 4059 tons for gas holders, 289 tons for blast furnaces and 7763 tons for stacks and miscellaneous work. Only under tank cars is the tonnage relatively high. For this use, only one month of the past two years exceeds the 4238 tons credited to February, this having been last November, with 9298 tons. Previous to November were 11 successive months of less than 700 tons each.

On page 614 of THE IRON AGE for Feb. 26 will be found a table showing the monthly figures for fabricated steel plate bookings for 1923 and 1924. January and February figures, with the same details there shown, follow in net tons:

		Oil Storage Tanks	Re- finery	Tank Cars	Gas Holders	Blast Fur- naces	Stacks, Etc.
1925	Total						
Jan.	26,859	4,314	1,165	1,285	6,529	4,495	9,071
Feb.	20,795	3,321	1,125	4,238	4,059	289	7,763

Real wages, based on purchasing power, long have been higher in the United States than elsewhere. An index, compiled by the International Labor Office, shows American (real) wages last October almost twice as much as in London. Other figures show Ottawa as about 150 per cent of London; Amsterdam 85 per cent, Paris 75 per cent, Berlin 65 per cent, Brussels 58 per cent and Vienna 50 per cent.

Production Equipment in Iron Foundries

Value of the Use of Machines for Molding—Flasks and Their Handling—Core Making—Cleaning Castings

DEMAND for increased output, the shortage of skilled workers, and the disinclination on the part of new labor to enter foundry work have resulted in the development of production equipment designed to overcome in some degree the handicaps of the industry. Earlier developments tended particularly toward equipment for increasing output. Present trends point toward machines designed not only to increase and improve output, but in addition to reduce the labor load. This last consideration has become a problem vital to all industry.

A foundry's proportional expenditure for labor in respect to total output is much higher than that of the

slinger, is made in several types, each designed for particular duty as follows:

Stationary Type—Adapted for use in conjunction with sand conveying systems.

Portable Type—Used in general jobbing foundries. It can be moved about with a crane and thus can be used to form any size of mold.

Tractor Type—Travels on racks in a bay of the foundry, goes into the sand heap on its own power, gathers, riddles and delivers sand to the mold.

Locomotive Type—For jobbing and production foundries. This machine travels on rails under its own power. It cuts, riddles and prepares heap sand for molding.

Operation of Sandslingers.—Sand is supplied to the feeding device of the sandslinger according to the type



Fig. 1.—Locomotive Sandslinger

average manufacturing plant. Growing shortage of men is stimulating many foundries to improve working conditions. Back-breaking tasks are not conducive to best results, whether the worker be a molder or a laborer. Heavy turnover in a particular class of employees or on an individual job points usually to some too burdensome task as the underlying cause. Numerous instances were observed in the survey of the introduction of production equipment to overcome handicaps due to labor shortage and to facilitate performance in the foundry. Below are given some cases observed which illustrated the use of labor-saving equipment:

Molding

Sandslinger Molding Machine.—An important development for eliminating burdensome tasks, increasing production and compensating for the lack of skilled men is the machine shown in Fig. 1. It is designed to convey sand from the heap or hopper, and to riddle and deliver the sand to the mold with sufficient force properly to impact it. This machine, known as a sand-

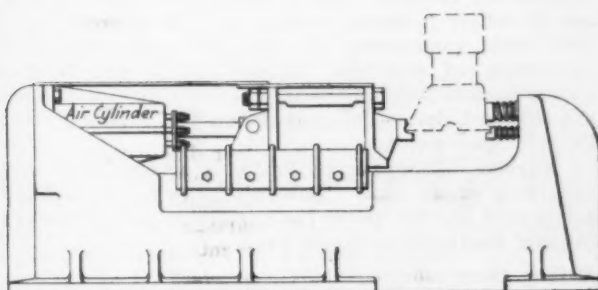


Fig. 2. (Above) This Core Cleaner, Embodying the Vibrator Principle, Is Designed to Suit the Casting to Be Handled. It makes the removal of cores easy and effective

of machine used. The tractor type travels into a heap of sand down the middle of a bay of the foundry; the portable is supplied by a crane with clam shell bucket; the stationary sandslinger is fed by a conveyor; the locomotive type travels over a heap of sand, cuts, riddles and delivers the sand to the mold.

The bucket conveying device shown in the photograph elevates sand from the heap and drops it into a receiver, where it is riddled. Gagers, nails and other foreign materials are removed and the riddled sand is delivered to a moving belt which conveys it to the impeller head of the machine. The impeller head throws the sand at a velocity of from 2700 to 6000 ft. per min., as desired, to the point in the mold to which the operator directs it. A wide radius of operation is made possible by the swivel head.

Some data on the performance of sandslingers furnished by the manufacturer will be of interest.

Production.—Molds containing from 2 to 4 cu. ft. of sand can be rammed at the rate of 5 cu. ft. per minute. Those containing 10 cu. ft. or more can be rammed at the rate of 10 cu. ft. of sand per minute.

Ramming.—The desired density of the sand in any part of the mold is controlled by the speed of the paddle in the impeller head. More rapid movement of the paddle gives greater density of sand in the mold.

Study of Adaptability Necessary.—Some study of plant facilities as regards the operation of a sandslinger

This is the sixth of a series of ten descriptive studies of management practices in the foundry, made by the Policyholders' Service Bureau of the Metropolitan Life Insurance Co., New York, to be of practical assistance to group policyholders in the foundry industry. Previous articles have appeared at page 1334 of THE IRON AGE, Nov. 20, 1924; page 1552, Dec. 11, 1924; page 193, Jan. 15, 1925; page 551, Feb. 19, and page 691, March 5.

is necessary before installation. This fact was demonstrated at one plant, where failure to deliver sand in adequate quantities and a crowded condition in the foundry operated to reduce the effective molding time of the sandslinger. In other plants every effort was made to use the sandslinger 100 per cent of the working time, by minimizing delays due to lack of sand supply or of flasks to be filled.

Jolt Roll-Over Molding Machine

Large and medium-sized floor work was handled on jolt roll-over machines in 29 of the 54 plants visited. Excellent results were claimed for this type of machine in comparison with hand molding. More uniform castings, less skilled labor, much larger output and less common labor were among the results reported.

Floor and Machine Molding Compared

A brief comparison of the floor and machine methods of molding will illustrate the possible economies in the use of the jolt roll-over machine and at the same time bring out the marked differences between them in operation:

Placing the Pattern

Floor.—New placement of pattern with each mold.

Machine.—Fixed placement determined by original mounting.

Ramming

Floor.—A large amount of molding time is occupied in ramming (average 50 per cent). The work is tiring and its effect is shown toward the end of the day in less dense compacting of sand, with resulting non-uniformity of castings. In addition to the fatigue experienced in hand ramming, varying densities of sand are obtained, due to different methods of ramming used by individual molders.

Machine.—Ramming by jolting is accomplished in a relatively short time. Laboratory tests of molding sands used will determine the number of jolts necessary for any required density of sand.

Rolling Over

Floor.—The molder requires additional assistance in the form of helpers or cranes to roll flasks over. Delays due to waiting for helpers and cranes increase molding time and decrease output. Handling by these means often results in damage to molds.

Machine.—The operator rolls over molds with the roll-over equipment on his machine.

Drawing the Pattern

Floor.—The painstaking lifting of the cope, whether by hand or crane, is unevenly done at best. Loosening the pattern preparatory to drawing enlarges the mold, resulting in overweight castings. Time is taken in repairing and patching the mold as a result of the local destruction incident to drawing.

Machine.—By applying the vibrator and the stripping mechanism, the pattern is removed immediately.

Several additional operations not necessary in machine molding are performed in floor molding. The use of the jolt roll-over machine is another instance of the substitution of machine methods for the more uncertain hand work, thus making the task more easy and lowering costs.

Flask Equipment

For efficient operation molding machines require flask equipment especially adapted to the work performed. The use of defective, poorly designed or burned flasks entails losses in production. Special effort to provide proper flask equipment is found profitable. A few results of the study of flask design will serve to illustrate the advantages of careful planning:

One automobile plant turned out approximately 1500 cylinder blocks a day, using 24 flasks in continuous operation. The flask requirements had been determined and the design was such that there was just enough sand in the completed mold to handle the molten metal.

Another plant found it necessary to increase pro-

duction, with no additional equipment or extra floor space allotted. A slight rearrangement of pattern placement in the flasks doubled the number of castings from a single flask. This could have been accomplished as well in other plants visited.

Still another plant, a jobbing foundry of 80 molders employing hand molding throughout, redesigned flasks to conform closely with the contour of patterns. Work was on a quantity production basis. Because of the redesign a material increase in production through increase in individual output occurred, accompanied by a reduction in defective castings. The quantity of sand handled per mold was cut down considerably. The strain on the molders was less, resulting in more good castings from a day's work. Production compared so favorably in this particular plant with what might be accomplished by machine molding that hand methods prevailed even in an expensive labor market.

Standardization of flasks eliminates much useless equipment and relieves storage space. A familiar sight is a foundry yard or roof covered with dilapidated flasks. Doubtless each flask was constructed and used for an individual job, and the same job later received in the shop would require the construction of a similar flask, which would likewise take its place in the yard or on the roof. This graveyard of flasks need not exist, or at least can be made considerably smaller, if flask requirements are studied and a few standard sizes determined on. Records should be kept of the location of flasks, so as to avoid duplication.

Shaking Out Flasks.—Congestion on the floor of continuous foundries has resulted in the development of devices and systems designed to reduce time and labor in shaking out flasks.

A "shakeout bail" used in some of the foundries visited is operated by vibrators and fitted to the flask size used. This device considerably reduces the time consumed in shaking out flasks by hand methods. Damage to flasks caused by the usual hand method of removing the impacted sand from the flasks is avoided where mechanical vibration is used.

Moving Floor to Remove Materials Shaken Out.

One plant manufacturing automobile parts installed a moving belt about 5 ft. wide running the length of the foundry, to remove sand and castings as shaken out. Castings are removed from the belt at points along the floor, in accordance with a size classification of the castings. The remaining sand and scrap metal are sent over a metal separator into a sand hopper for retempering. In this case the belt was installed because of cramped floor space. The installation removed the contents of flasks as shaken out, so as to eliminate previous congestion.

Coremaking

Machine Molding.—The possibilities of increasing production by the use of molding machines in the core room had not received attention in a number of the foundries visited. Ten plants made cores on molding machines; seven of the ten were automobile plants.

One foundry had made a comparison between the performance of molding machines and hand work, and decided that the molding machine was better for large and medium sized cores, and hand methods better for small cores. However, no decision apparently has been reached as to just when it is best to use a molding machine. Each class of core presents an individual problem, to be handled separately. But the accomplishments of molding machines for core work are believed to warrant experimentation to determine whether they are adaptable to given jobs.

Sand Mixing.—Economies in the use of core oil or binder resulted where central mixing of core sand was employed. Sand mixing machines distribute core oil more thoroughly and uniformly than hand mixing. As a result, cores from machine-mixed sand are standardized. This permits temperature control in the baking of cores because, with a uniform mix, the time and temperature for proper baking, once determined, can be prescribed for future use on mixes of like makeup.

In one plant visited core oven temperatures were taken on a self-recording instrument and a permanent record thus made for future comparison and to deter-

mine proper oven temperatures for various mixes. In addition, an accurate gage was installed to measure core oil and insure exact quantities in sand mixes.

Wiring of Cores.—The physical structure of cores presents possibilities for facilitating removal after casting. Wires are inserted for strengthening cores. These wires may serve as means of quickly disintegrating the core after casting. The wiring is so arranged that one key wire, easily reached after pouring the casting, controls the other wires. The removal or movement of the key wire facilitates the destruction and removal of the core. This ingenuity in the making of cores saves considerable labor and time in the cleaning room.

Gaging and Checking Cores.—It is the practice in large automobile plants to gage all cores before and after assembling in the mold. Gages, templets and fixtures have been made part of the core inspection equipment. After removal from the ovens, cores are gaged for size and their placement in an assembly is checked by a special fixture. Castings defective on account of walls too thin or too thick and overweight or underweight castings are considerably reduced by this checking of cores.

A checking system might be applied to any foundry. The resulting decrease in rejections usually compensates for the effort expended by increased output and better satisfied customers. The equipment required would vary with the type of work carried on at the foundry. Rough work needs very simple checking; high-grade castings, like automobile parts, require special fixtures and intricate gages.

Cleaning Castings

Removing Cores.—Reference was made to the possibility of easier removal of cores from the poured casting by proper placement and design of the wires in the cores. In this connection it may be noted that core sand mixes often are made with reference to ease of disintegration of the core after pouring. Mixes designed especially for hardness of core often increase cleaning costs. Study of mixes adapted to the special needs of the foundry and the use of easily disintegrated cores will decrease cleaning costs.

One foundry studied a mix of beach sand and oil for large cores. Previous to the test, it was believed that such a core would lack strength. The test proved that the core had sufficient strength and yet disintegrated readily.

Hydraulic Core Removal.—An effective means of removing large cores was an hydraulic system operated like a sandblast. Castings were placed on a table in the center of a room. An operator stationed at an observation window, similar to that of a sandblast room, directed a stream of water from a nozzle so that it played on the core.* This method saved battering the core and lessened the danger of breaking castings. Time and labor were saved in removing cores.

Jolting Machine for Core Removal.—Cores of automobile cylinder blocks are effectively removed by jolting. Castings taken from flasks by hoists are placed in a specially designed receiver on the platform of a jolt machine. The receiver acts as a guide or basket to hold the casting upright and to prevent its falling from the platform during jolting. Several jolts suffice to remove the more intricate cores. A comparison of time taken and energy consumed between hand and "jolt" methods shows important advantages in favor of jolting.

Jolting machines require adequate foundations to withstand constant strain. A large number of castings of like shape is a necessity in this method, as the receiver of the jolt machine must conform fairly closely with the contour of the casting.

Core Removal by Vibrator Machine.—A machine for disintegrating cores, embodying the vibrator principle, is used by one foundry for the removal of cores from automobile cylinder blocks. Fig. 2 shows this device. The machines are built to suit the size and shape of the

casting to be handled, and make the removal of cores rapid and effective.

Tumbling Mills

It was observed that cleaning mills or tumblers were "down" frequently for repairs. The principal difficulty was worn bearings. At least, this was the cause of trouble which, when neglected, usually resulted in a complete wreck of the tumbling mill.

A simple solution was found by one plant in the installation of roller bearings incased in a tight covering filled with heavy grease. The cover was so fitted as to exclude dust. Long usage on heavy castings had failed to dislodge the bearings or wear away the shaft. There was no wear and tear on the ventilating system at the point of entering the mill. As a result, the air in the cleaning room was free from dust and production was unobstructed by broken down mills.

Welding

Welding of defective castings is practiced by a number of foundries, as it increases the number of acceptable castings poured. In some foundries welding is on a production basis. Castings are heated in annealing ovens, carried to the welding stations for welding, then returned to annealing bins or sand piles, covered, and allowed to cool slowly.

A large automobile plant makes a careful inspection of all rejected castings. Those which may be made useful by welding are put through the welding process. This method of reclaiming castings has decreased (finally) rejected castings from 15 per cent to 2.5 per cent of total pourings.

Annual Spring Meeting of American Electrochemists

The annual spring meeting of the American Electrochemical Society will be held at the new Hotel Niagara, Niagara Falls, N. Y., April 23 to 25. The feature of the convention will be a symposium on fused electrolytes which will be held on the first day. On the evening of that day Dr. Mees of the Eastman Kodak Co., Rochester, N. Y., will deliver a lecture. The annual meeting, at which the presidential address of H. C. Parmelee, editor *Chemical and Metallurgical Engineering*, New York, will be delivered, and at which new officers will be elected, will be held Friday morning, April 24. At this session also, and at the technical session Saturday morning, miscellaneous papers will be delivered and discussed. Another feature of the convention will be a round table luncheon discussion Friday, April 24, on teaching of electrochemistry, with Dr. O. P. Watts, associate professor of chemical engineering, University of Wisconsin, Madison, Wis., in charge.

Meeting on Bolt and Nut Packing Standards

Following the action of other industries, manufacturers of bolts and nuts, working in conjunction with the Division of Simplified Practice of the Department of Commerce, Washington, are planning to reduce the excessive variety of packing methods in their product. The manufacturers have appointed a simplification group, headed by Ralph Plumb, president Buffalo Bolt Co., North Tonawanda, N. Y. This committee is studying the methods employed at present among various manufacturers to note the number of items which, in their judgment, can be eliminated. A meeting of the committee to report on the progress attained will be held at North Tonawanda, April 3.

Field sales organization will be discussed at a meeting of the sales executive division of the American Management Association, 20 Vesey Street, New York, to be held at the Boston Chamber of Commerce, Boston, April 7 and 8. In addition to the presentation of a research report, the plan of organization of several companies, including the American Radiator Co., the Sterling Range & Furnace Co., and the Bussmann Mfg. Co., will be outlined.

*This method was described in detail in *THE IRON AGE* at page 946, March 27, 1924.

Six-Block Continuous Wire Drawing

Differential Gearing Arranged to Handle the Blocks
Without Undue Tension or Slackness in the Wire
—Dry Drawing to No. 21 Wire

THREE years ago (page 416, THE IRON AGE, Feb. 9, 1922) a description was published of a four-block continuous wire-drawing machine brought out by the O. & J. Machine Co., Worcester, Mass. This was a self-contained motor-driven unit, built in three sizes, drawing from a No. 5 wire rod in the roughing size down to a No. 21 gage in the final finishing size. A six-block unit was included in the line, although the four-block unit was the one described.

Description of Differential Gearing

Differential gearing constitutes the big feature in the operation of these machines. In the four-block machine the power is applied through a pair of reducing gears from the electric motor to a main shaft. This in turn drives what is called a master differential, as shown in Fig. 1. From each side of this master differential projects a shaft, each of which through a pair of spur gears drives another differential. These latter differentials are so placed that each one drives two blocks, the differentials thereby compensating for the variation in the elongation of the wire being drawn by the two blocks. Meantime the master differential compensates for the variation in the elongation between the first set and the second set, that is, between block No. 2 and block No. 3. This gearing, with other features of the machine, was patented Jan. 9, 1923.

In the six-block machine the principle of operating through differentials is the same as before, although the arrangement of differentials is different. In this case the master differential, Fig. 3, acts as a compensator between two units of three blocks each. From each side of the master differential projects a shaft, each of which in turn drives a back shaft which drives a sub-master differential. One side of this sub-master differential drives the last block in its group of three, that is, block No. 3 in the one case and No. 6 in the other. The other side of the sub-differential, through another back shaft, is geared into a final differential in each group, driving Nos. 1 and 2 blocks in the one case and Nos. 4 and 5 in the other. As before, the various differentials act as compensators or speed regulators.

Each differential is flanked by a ratchet gear free to run behind on the differential shaft and driven by a pinion keyed to the driving shaft. These ratchet gears furnish the means for stringing up the machine and properly holding a load on each block, as the end of the wire being drawn leaves the blocks in succession. If it were not for these ratchet gears the machines could not be strung up, because the moment a wire pull or load was applied to the first block, that block would stand still and the others would spin around. The same reasoning applies on the finishing end of the bundle, where No. 1 block would spin around the moment the end of the wire came through the first die, and the rest of the blocks would stand still.

Minimum Friction Essential

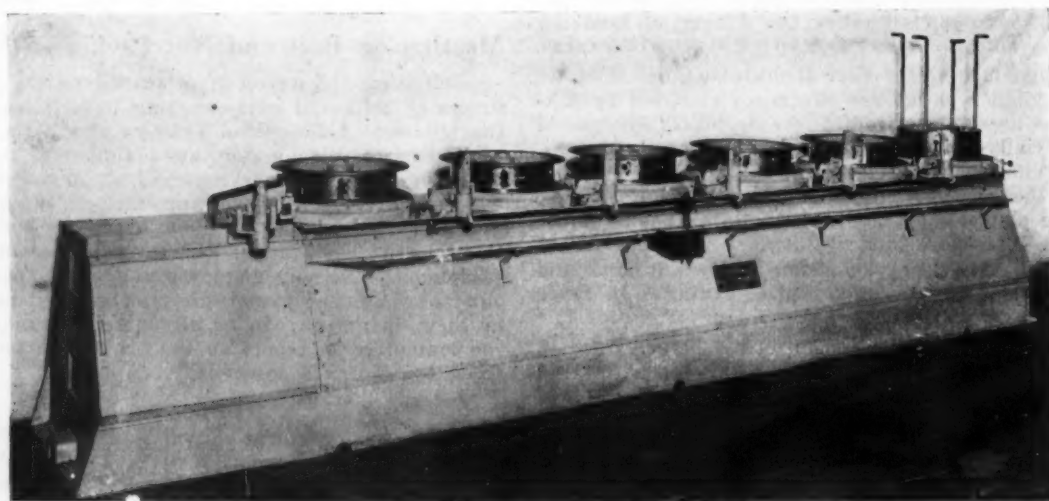
For the differentials to function properly, it is essential that the machine be so constructed that friction will be reduced to a minimum. The whole machine must be sensitive to the least amount of wear in the wire-drawing die. This condition presupposes ball bearings throughout. Every bearing on this machine is a ball bearing and every bearing and every gear runs in a bath of oil in a dust-tight compartment, except for the top spindle bearing, which is housed in a bearing casing and packed with a light grease.

Proper alinement of all ball bearings is assured by building each machine on a one-piece cast iron base. In this base is planed a straight groove for each line of bearings, and each bearing is tongued, to secure permanence of alinement. The cast iron base constitutes the oil case. The motor compartment, at one end, is fitted with a felt packing, where the shaft comes through.

Operation of the machine is from a push button station, with control box placed in any convenient location. Regulation of motor speed is through a small field control conveniently mounted on each machine.

Continuous wire-drawing machines of the Oslund type are built in four sizes, as follows:

Two-block	type, 22-in. diameter blocks
Two-block	type, 16-in. diameter blocks
Four-block	type, 16-in. diameter blocks
Six-block	type, 16-in. diameter blocks



Six-Block Wire-Drawing Machine of the Oslund Type. Wire or rod enters the die at left of left-hand block (or reel), passes around that block, through the next die, around the next block, and so on to the sixth block, where it coils up in final form and whence it is lifted off. The motor is in compartment in left foreground. The gearing under the blocks runs in a bath of oil, for which the base of the machine—one solid casting—forms the reservoir

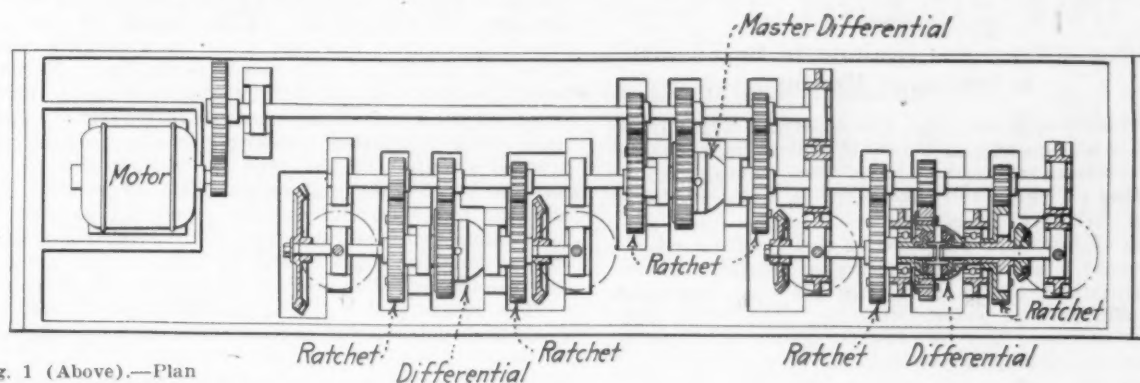


Fig. 1 (Above).—Plan of the Gearing in the Four-Block Continuous Wire-Drawing Machine. The motor, through appropriate reduction gears, drives the master differential at the center. This drives in turn the two group differentials, each in the center of its own group of block drives. Ratchet wheels are used to permit stringing up the machine and getting it into initial operation

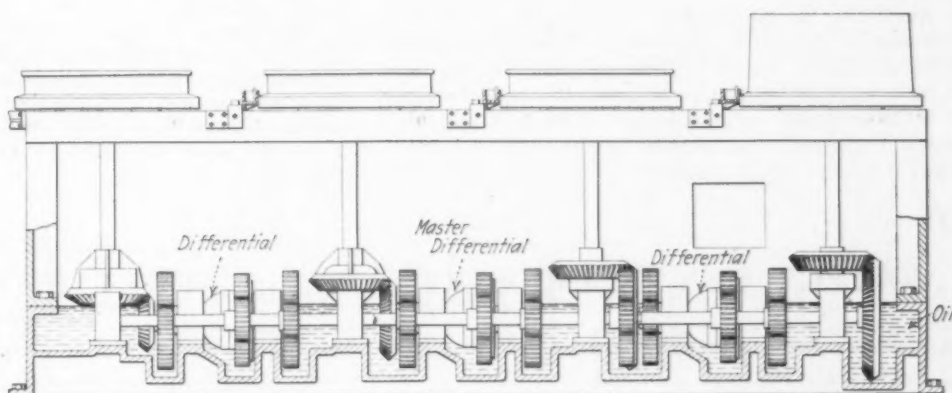


Fig. 2 (at Right).—Elevation and Partial Section of the Four-Block Machine, Showing Location of Oil Surrounding the Lower Portions of All of the Gearing Sets

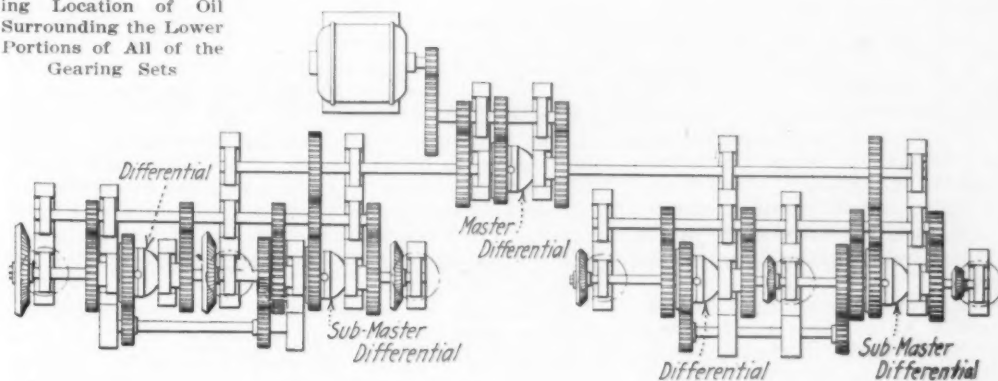


Fig. 3.—Gearing for the Six-Block Machine. Here the master differential drives two sub-master differentials, each of which in turn drives one differential and one block. The two final differentials drive two blocks in each case. Ratchet gears are used as in the four-block machine. In the machine as built, the motor is in its separate compartment at the end as shown in the photograph of this machine and as shown in the four-block machine (Fig. 1)

Machines in these four sizes will handle anything from a No. 5 rod down to the smallest size wire which is customarily drawn dry. As No. 5 rods usually run rough and oversize, it is found best practice to draw them to No. 14 or 15 gage by two drafts at a time. This is done conveniently on the two-block machine with large blocks, and reduces the material from 0.207 in. diameter to 0.080 or 0.072 in., as the case may be. By taking these two drafts at a time on a two-block continuous machine, instead of on separate blocks, a saving of 50 per cent in handling is effected.

To attempt to take more than two drafts at a time by the continuous method, when working from a No. 5 rod, entails too great a risk of breakage and shut-down or, as an alternative, too little reduction in diameter for best operative results. This is due to the unevenness of the hot rolled rod which forms the raw material for the wire-drawing mill. After annealing at No. 14 or No. 15 gage the wire, being now of uniform diameter throughout its length, can be drawn four or six drafts continuously at the greatest possible efficiency.

Another advantage of using a two-block machine for the first or roughing operation is that the operator can adjust the speeds of his machines to suit the sizes he is handling, and also should be able to do his ripping at a higher speed than would be permissible with the

larger number of blocks. The two-block machine is particularly flexible for this heavy work. The smaller size of two-block machine is used where it is desired to put the wire through two drafts only, from No. 12 gage or smaller stock, for the purpose of producing a special size.

Results in Practice

Some of the operating results reported by users show great savings in man-hours per unit of product. In one case, where soft Bessemer weaving wire is drawn from No. 14 gage annealed to No. 20½ gage, one man operates six of the six-block 16-in. machines. In 10 hr. he produces from 5000 to 6000 lb. of finished wire. This is in contrast with a maximum production per man in 10 hr. of 1700 lb. on the old type of wire drawing frame, using 8 to 10 blocks. With the machine, the man takes care of 36 blocks in place of the 8 or 10. The finishing speed at about 175 r.p.m. represents some 735 ft. per min.

In another case a large manufacturer of curtain spring wire uses one man for four four-block 16-in. machines in drawing spring wire of 0.75 to 0.80 per cent carbon. This machine draws the wire from No. 15 gage to No. 19 gage and each group of machines, operated by one man, produces from 2500 to 3000 lb. of finished wire per day of 9 hr.

NEW ORGANIZATION PLANNED

American Refractories Institute to Be Launched at Pittsburgh Meeting

PITTSBURGH, March 30.—The American Refractories Institute is the name of a new organization, plans for the formation of which have been completed and launching of which will take place at a meeting to be held at Pittsburgh, April 14.

One of the main purposes of this institute will be to provide a satisfactory means of contact between representatives of the industries that use and those that manufacture refractories, in order that their various economic and technical problems with respect to heat-resisting materials may be thoroughly considered and that efforts may be made in the solution of these problems.

According to the announcement, it is proposed to maintain a research laboratory, where outstanding problems will be studied. These problems will be those of the consumer as well as those of the manufacturer.

It is generally conceded that there is a real need for an organized establishment of the type of the proposed institute. It is therefore pleasing to learn that

there is every indication that the project will receive the whole-hearted cooperation of consumers and manufacturers of refractories. Endorsement of the undertaking, in fact, has been given by a large number of men in the field of refractories technology. This interest has been manifested by applications for membership from a considerable number of industrial executives. The organizing committee is now inviting the especial attention of men who use refractories, in accordance with the fundamental idea of making the institute a service bureau for consumers as well as for producers of refractories. The membership dues will be nominal, since it will be necessary to provide only for the actual operating expenses of the institute.

The meeting to be held in Pittsburgh, April 14, when final plans for incorporation of the institute will be discussed, will be open to the representatives of industrial firms that use refractories, in order that all interested may become acquainted with the plans that have been made.

Macdonald C. Booze, senior incumbent of the Multiple Industrial Fellowship on Refractories, Mellon Institute of Industrial Research, Pittsburgh, has been appointed temporary secretary of the organizing committee of the new body. Mr. Booze will be glad to furnish further particulars regarding the coming meeting.

COLLEGE MEN IN INDUSTRY

Suggestions for Better Preparation of the Individual, Both in College and After Entering Business

Need of broad courses in subjects that will develop the ability of clear thinking, analysis and judgment, in the college education of men preparing for technical occupations in industry, is commonly felt by both college graduates and management, according to a study of technical education in its relation to the metal trades industries, made by the National Industrial Conference Board. Both management and college trained employees also agree that better results would be accomplished in the use of technically trained men in the metal industries by closer relationship between the colleges and the industries.

While technical men who chose occupations in their lines of training generally have found their college education satisfactory, they either better equipped themselves by further studying, or definitely indicate now the lack of courses which they consider would have increased their efficiency in their present work. Among these are cited business administration, psychology, law, public speaking, management, economics and accounting, as well as general engineering and chemistry.

The largest number of the 236 companies cooperating in the survey of the conference board declared mechanical engineering to be the best training for the metal industries. A number of companies, however, coincide with the suggestion that business administration courses should supplement the purely technical courses.

Among constructive criticisms advanced by college graduates, in answer to questionnaires, is the one suggesting that the metal trades industries should provide training for college men after their absorption into the industry. A well organized course designed especially for college trained men is recommended in this connection. Significant among the recommendations made by management representatives in the better preparation of college men for the industry is that of "better training in the use of the English language."

Six hundred and eighty tons of pig iron was shipped via barge from the Birmingham district the past week for California points, the iron being loaded on ship at Mobile and then moved through the Panama Canal. This was the largest shipment of pig iron in a long while from the Birmingham district to the Far West.

NEW TARIFF LAWS

Measures Enacted and Proposed in Canada and British India Affect American Interests by Raising Schedules

WASHINGTON, March 31.—Canada and British India, according to cablegrams received by the Department of Commerce, have recently enacted and proposed tariff legislation which affects American iron and steel and machinery interests.

The British Indian legislative assembly has passed the finance bill which, among other things, reduces the import duty on machinery and railroad materials but increases duties on iron and steel hardware and automobiles. The cablegram, received from Assistant Trade Commissioner E. G. Sabine, Bombay, did not state the new duties.

In Canada an amendment to the dumping regulations provides that imported articles of a class or kind made in that country are subject to severe penalty when the export or actual steel prices to the Canadian importer is more than 5 per cent less than the appraised value. The cablegram received from Trade Commissioner Lynn W. Meekin, Ottawa, said that the special duty imposed in such cases equals the difference between the selling price and the appraised value but does not exceed 15 per cent of the latter. This special duty is in addition to the regular import duty.

The budget submitted by the Acting Minister of Finance on March 4, to the Canadian Parliament, now in session at Ottawa, includes proposals for changes in import duties provisionally indorsed from March 25, affecting among other things, rolling mill rolls, engines for use in boats owned by individual fishermen, and well drilling machinery. The bill also proposes a number of articles to the list of products exempted from the sales tax. Among the latter are engines for fishing boats, well drilling machinery, and material to be used in the manufacture of the latter, and also gasoline engines. Rolling mill rolls of chilled iron or alloy steel which have been admitted free of duty since Aug. 5, 1924, are made dutiable at the former rate of 27.5 per cent general; 25 per cent intermediate, and 16 per cent preferential.

Engines for fishing boats owned by individual fishermen, will be dutiable at 15 per cent ad valorem, general; 12½ per cent, intermediate; and 10 per cent preferential. Well drilling machinery, apparatus and parts, and rope for deep well drilling and for prospecting for minerals, are dutiable at 5 per cent ad valorem from all sources.

Metallurgical Research in England

Buildings and Equipment of a Celebrated Institution, the National Physical Laboratory—Some of the Work Done in Metallurgy

BY DR. WALTER ROSENHAIN, F.R.S.

METALLURGICAL research at the National Physical Laboratory has grown, during the past 20 years, from very small beginnings. Prior to the foundation of the National laboratory in 1901, metallurgical research had been centered chiefly in the work of the alloys research committee of the Institution of Mechanical Engineers, under whose auspices brilliant work was done by the late Sir William Roberts-Austen. This work was for some time carried on, under unsatisfactory conditions, in the laboratories of the Royal Mint in London, and the pursuit of this type of research was put forward as

that the aspect of metallurgy with which the laboratory deals, sometimes known as "physical metallurgy," was a very young science in 1900, and this branch of the laboratory has grown with its subject—scientific metallurgy has now come to occupy an important place, not only in the application of science to the metallurgical and engineering industries but it is even beginning to make itself felt in the range of pure science itself.

Buildings and Equipment

Externally, the metallurgical buildings of the National Physical Laboratory—or "N. P. L.," as it has



FIG. 1.—Sketch Plan of Metallurgy Department at the National Physical Laboratory, Teddington, England. Rooms 1, 2, 3, 4, 5, 6, 7 and 12, Chemical Laboratories for Steel, Alloy and other Analyses; 10, Balance Room; 8, 9 and 11, Staff Offices; 15 and 16, Special Researches (Gases in Metals); 17, 18 and 19, Photographic Developing and Printing; 20, 21 and 22, Grinding, Polishing, Etching and Mounting of Metallographic Specimens; 26 and 27, Visual Microscopy and Photomicrography; 23 and 24, Special Refractories—Crucibles, Muffles, Couple Sheaths, etc.; 30, Workshop and Testing Machine; 32, Sand Molding; 31, Electrical Machinery; 33, Foundry; 33a, High-Pressure Air

Furnaces; 34, Foundry Stove; 35 to 40, Staff Offices; 41 to 43, Furnace and Potentiometer Rooms; 44, Heat-treatment Laboratory; 45, Gas Furnaces and Carbon Ring (Electric) Furnaces; 46, Main Potentiometer and Chronograph; 47, Gradient Furnaces; 48, Storage Battery; 49, Laboratory Workshop; 50 to 53, Staff Offices; 54, Hardness Testing; 55, High-Temperature Electrolysis; 56, Departmental Reference Library; 57, Physical Measurements; 58, Thermostats and Ultra-violet Spectrograph; 59, Storage Battery; 60, Store Room; 61, Experimental Rolling Mill; 62, Storage Battery for Mill and for Experimental and other Furnaces

one of the proper duties of a National Physical Laboratory. Accordingly, work on a scale not much more adequate than that at the Mint was begun at Bushy House, Teddington, by Dr. (now Professor) H. C. H. Carpenter.

When the present writer succeeded Professor Carpenter in this work in 1906, a separate department of metallurgy was established, but only one junior assistant and one laboratory boy were available and the research work undertaken consisted mainly in carrying out the program of the alloys research committee. This work, and its successive stages of development, has always remained one of the main features of the activities of the department but, in place of the minute staff above mentioned, the department now numbers a scientific staff of over 30, with other grades totalling to over 80 persons, while the buildings, equipment and range of work have increased correspondingly.

This large development is due, in part, to the fact

come to be widely known—are of a strictly utilitarian character without attempt at architectural effect. They have, however, the great advantage that they have been specially designed and built for their specific purpose without the restriction of conforming to other considerations. The general arrangement, and to some extent the scale of the equipment, can be gathered from the plans of the various floors of the buildings which are reproduced in outline in Fig. 1. It will be seen that the laboratories, as distinct from the buildings of the foundry and rolling mill, are arranged as a series of comparatively small rooms, each arranged for a specific kind of work. The uses of the rooms are indicated by reference to their lettering below the plans in Fig. 1. Thus it will be seen that emery-grinding, polishing and etching are each carried out in separate rooms, while visual microscopy and photomicrography are also separated, much to the advantage of each type of operation as carried out in detail.

Again, there are separate rooms for the "gradient" furnaces used for taking thermal curves and for the electrical observing and recording instruments with which such curves are determined. Apart from these rooms devoted to specific operations of a more or less standardized nature, which are common to most metallurgical researches, there are other rooms available for special purposes that may arise from time to time in which apparatus or even small-scale plant of a special kind can be assembled and used without disturbance. Thus one room is devoted to apparatus for the determination of the solubility of gases in metals, while in another is special apparatus for the preparation of some of the rarer metals by electrolytic means either from fusion or from aqueous solutions.

Without attempting to describe or even enumerate the equipment of these laboratories, a few typical pieces of apparatus may be mentioned, particularly as they are products of the laboratory itself, at least, in design or conception if not in actual construction.

Microscopic Equipment Different: The microscope equipment, for instance, is widely different from that

surface falls upon a cross-wire as seen through an eye-piece. This operation is much more difficult to describe than to carry out, since it only takes four or five seconds and the result is satisfactory for work of the highest precision.

Gradient Furnaces: The "gradient furnaces" used for taking heating and cooling curves are well known and now widely used. The specimen under observation is lowered or raised at will in the vertical tube of a furnace which is kept hot at one end and cold at the other, with a uniform temperature gradient between; in this way the specimen is heated or cooled uniformly at almost any desired rate. A group of such furnaces is shown in Fig. 5.

More complex is the "plotting chronograph" with which thermal curve observations are registered. In some laboratories, photographic or mechanical recording devices are used for this purpose but, while at Teddington such instruments as "thread recorders," etc., are also used for work requiring less accuracy and delicacy, it has been found that none of these appliances can yield curves which even approximately utilize and

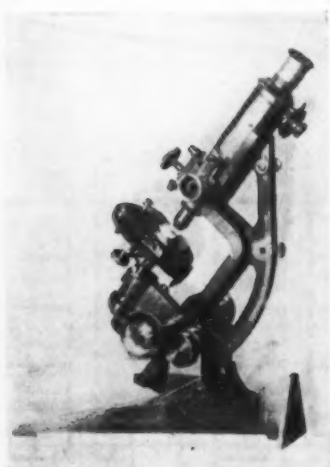


FIG. 2.—Rosenhain Metallurgical Microscope. This is a direct vision instrument which is used also for photomicrography, as seen in Fig. 3. It has a very stiff limb to which the body tube is rigidly attached. Illuminators are inserted through side openings in the body-tube. All focusing is done by movements of the stage, the fine-adjustment being concentric with the optical axis of the microscope

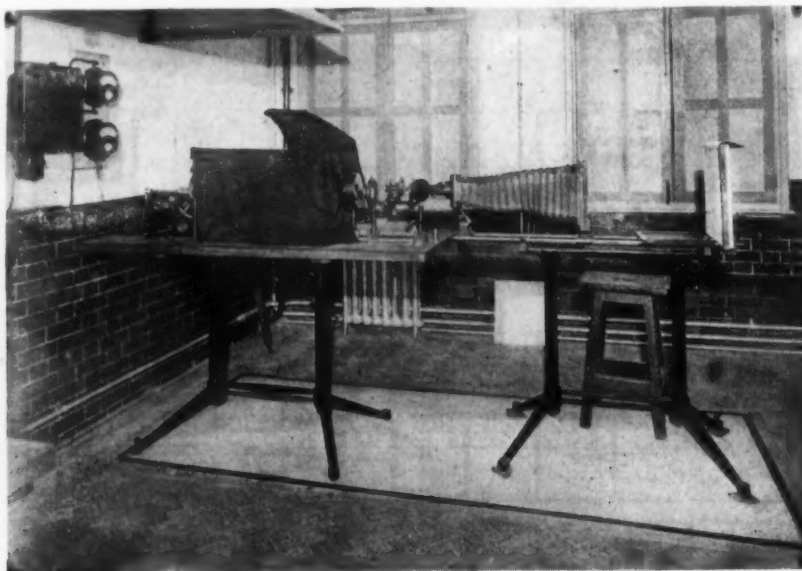


FIG. 3.—Projection Apparatus Used for Taking Photomicrographs. It is mounted in a special room, which can be completely darkened, and on an independent concrete foundation, isolated from the vibrations of the building. The microscope is fitted with a special focusing device operated by a rod from the screen end of the apparatus and arranged to relieve the microscope of all strain during focusing. This avoids the occurrence of "creep" during exposure

to be found in any American metallurgical laboratory. The "inverted" type of microscope, although it is available in the laboratory, finds little favor there, mainly owing to the fact that for careful and prolonged visual examination it is inconvenient and unsatisfactory, while, for the best kind of photomicrographic work, better results can be obtained with a horizontal microscope in which the use of image-reflection is avoided.

The microscope used principally at Teddington is one designed by the writer and illustrated in position for visual use in Fig. 2, while the same instrument forming part of a projection apparatus for photography, is shown in Fig. 3. It is mainly characterized by the feature of a tube fixed rigidly to the limb of the stand, all focussing, both coarse and fine, being done by movements of the stage. This type of microscope requires specimens mounted accurately "level" on a glass slip or other support before they are placed on the stage.

This formerly difficult and delicate process is now reduced to extreme simplicity by a small "optical leveling device," shown in Fig. 4. The specimen is levelled by adjusting it with the fingers on a support of wax or clay until a spot of light reflected from the polished

record the results obtained with the delicate potentiometric devices employed for obtaining the indications of thermocouples. Besides, such recording devices yield only the ordinary time-temperature curves, and these again are not sufficiently delicate to indicate the finer points. The plotting chronograph, while it requires the services of a skilled observer, who has to tap a key as the spot of light from a galvanometer crosses each successive line of a scale ruled on glass, furnishes all that is required, in the shape of an "inverse-rate curve" plotted accurately to scale direct from the tapings of the key.

The latest form of this instrument is illustrated in Fig. 6. Its mode of operation is difficult to describe briefly, but may be indicated thus: A pen moves horizontally from left to right at a uniform speed (about 2 mm. per sec.) above the paper placed on a large cylindrical drum. When the observer taps his key, the first effect is to bring the pen sharply down on the paper, marking a small dot. The pen is immediately raised again and at the same time is shot rapidly back to its zero position, from which it again starts out on its journey across the paper. Meanwhile, the drum has been turned through a small distance. When

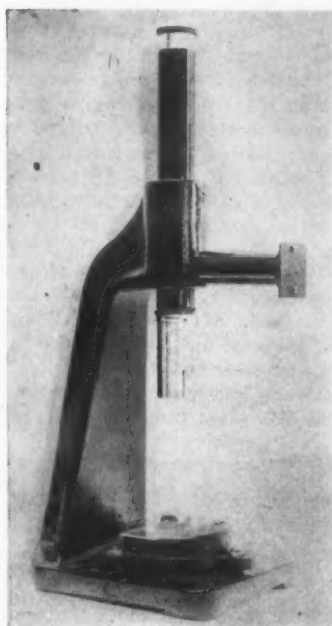


FIG. 4.—Optical Levelling Device to Facilitate the Correct Mounting of Metal Specimens for the Microscope. A small electric lamp is placed in front of the little hole in the plate shown on the right front of the instrument. The image of this illuminated hole is reflected down on to a glass mirror at the base of the instrument and up again to a focus formed on cross wires in the eyepiece. A polished specimen, held by wax, is placed on the mirror base and adjusted by hand until the spot of light is again seen on the cross wires. The polished face must then be accurately parallel to the face of the base mirror. This can be done in five seconds

the observer again taps his key, and the pen marks another dot, the distance of this dot from the zero position of the pen is proportional to the time which has elapsed since the previous dot was made, while each step around the circumference of the drum corresponds to the temperature interval represented by two successive lines on the galvanometer scale.

The curve produced by the succession of dots is thus one in which the time intervals occupied by successive equal increments or decrements of temperature are plotted against the actual temperatures at which they occur. On a typical curve obtained with this instrument the critical points are indicated by sharp peaks—very different from the slight and often vague flattenings of an ordinary time-temperature curve.

Thermostats and Their Use: Another piece of apparatus which is used extensively in the laboratory is the Haughton and Hanson thermostat. In modern research on the constitution of alloys, great importance is attached to securing that specimens for microscopic examination, whether slowly cooled or quenched, shall be in as nearly as possible perfect constitutional equilibrium. To attain this, very prolonged annealing at an accurately controlled temperature is required. The thermostat provides a means of carrying out such annealings, with an accuracy of temperature control of about one degree Centigrade at temperatures up to 1000 deg. C.

This result is achieved by means of a small electric resistance heater, generally of "nichrome" wire, wound around an air-bulb of vitreous silica. This bulb is provided with an inner tube in which the specimen, with its thermocouple, is placed. The air space which intervenes between this inner tube and the walls of the bulb proper acts as an air thermomoter and is connected by capillary tubing to a small mercury seal which serves as a delicate pressure gage. If the temperature of the bulb rises, the mercury is pushed down on the furnace side and up on the other side of the little U-tube in which it resides, with the result that it makes contact with a platinum wire inserted in the tube and, through a delicate relay, shuts off the whole or part of the heating current. If, on the other hand, the furnace temperature falls, the mercury moves in the opposite direction and makes another contact which increases the heating current.

Somewhat elaborate precautions are taken to avoid any effect upon the apparatus of fluctuations in the pressure or temperature of the surrounding air and these can be so arranged that, if desired, instead of maintaining a perfectly constant temperature, the "thermostat" rises or falls in temperature at almost

any desired slow rate. The most important feature of this apparatus—whose outward appearance is shown in Fig. 7—is that the air which acts as the controlling factor in the thermostat lies between the heating-coils and the specimen, so that incipient changes of temperature in the heating-coil are checked before they reach the specimen.

Some Recent Researches

The combination of microscopic examination, heating and cooling curves, and thermostat annealings and quenchings has furnished the laboratory with the means of carrying out a long series of researches on the structure and constitution of both binary and ternary alloy systems, including a number of groups of aluminum alloys, several alloys of copper and, most recently, alloys of pure iron with other elements. In their turn, the knowledge of these alloy constitutions has rendered possible the development of new materials of considerable engineering importance and has helped to furnish clear and rational explanations of a number of apparently mysterious phenomena in metals and alloys—among them those of age-hardening and tempering not only in some of the aluminum alloys but in steel itself.

One of the most striking cases which has been investigated relates to certain alloys of aluminum and zinc. Some years ago, in studying the constitution of these alloys, the writer and S. L. Archbutt discovered the fact that, when cooled at a suitable rate, an alloy containing about 78 per cent zinc and 22 per cent aluminum exhibits a microstructure indistinguishable from the pearlite of a carbon steel containing about 0.90 per cent of carbon. This microstructure is illustrated in Fig. 8. More recently, Hanson and Gayler, on further studying these alloys with the improved methods



FIG. 5.—A Gradient Furnace for Taking Heating and Cooling Curves at Any Desired Constant Rate of Heating or Cooling. The specimen is mechanically lowered into or raised out of the furnace, which is hot at the top and cold at the bottom. The thermocouple moves with the specimen and so does the cold-junction ice chamber which is seen as a vacuum flask suspended just above the furnace. Flexible leads connect this with the potentiometer

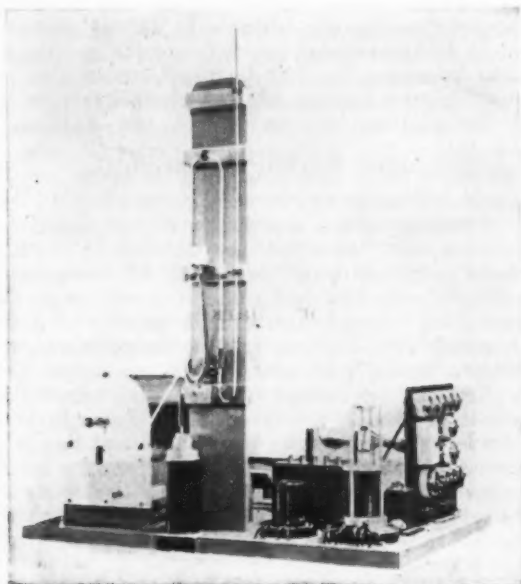


FIG. 7.—The Haughton and Hanson Thermostat with Adock's modifications. The thermostat furnace is shown on the left, the electrical relay and regulating resistances on the right. The furnace consists of a silica bulb with an inner tube, the bulb being heated by resistance windings. The air in the bulb acts as a constant-pressure air thermometer, being balanced against a barometric column (seen in center of photograph). A U-tube with a small mercury seal acts as pressure gage. If the furnace temperature varies, this mercury seal is moved so as to make or break contact with a relay circuit and this switches current supply to the furnace off or on as required. A temperature up to 1000 deg. C. can be maintained steady to within one degree C. for many weeks, while regular and very slow heating or cooling can be carried out also

now available, not only completed the equilibrium diagram of the system in a satisfactory way: they also showed that these alloys, like the steels, can be hardened and tempered, but with this difference—that, in the zinc alloys, tempering proceeds very rapidly at the ordinary room-temperature so that, if the alloys are to be kept hard, they must be kept at some low temperature like that of liquid air. If a piece of such an

alloy is quenched from a suitable temperature in iced brine and is removed from the brine and held in the hand it is, at first, very cold. In a few minutes, however, its temperature rises—as the result of the heat spontaneously evolved in consequence of the tempering action which occurs, and at the end of three or four minutes the specimen becomes much too hot to hold in the hand. The full explanation of this striking phenomenon and its bearing upon the nature of hardening and tempering in steel has been given in a number of recent papers; it is too long a story to be given in detail here.

Fundamental and far-reaching as researches of this kind may appear from the metallurgical point of view, the advance of modern methods of investigation has placed still more powerful tools in the hands of the investigator, and the N. P. L. has not failed to avail itself of these also. The microscope has made it possible to study the arrangement of the constituent crystals of

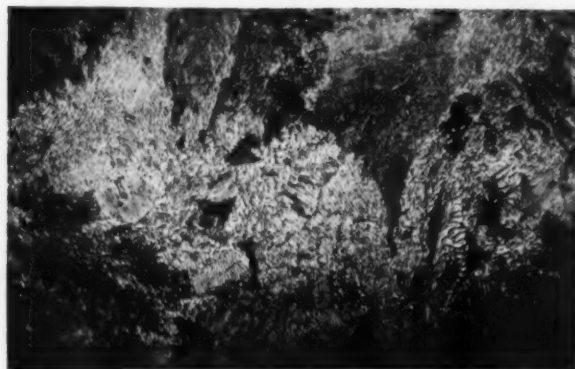


FIG. 8.—Microstructure of an Alloy of Zinc and Aluminum Containing About 78 Per Cent of Zinc, Which Has Undergone the Eutectoid Transformation at 264 Deg. C. This microstructure is indistinguishable from that of the eutectoid of carbon steels, known as "pearlite," and its formation is due to similar causes. The austenite and troostite of steels can also be closely imitated in these alloys, which can be hardened by suitable heat treatment. These alloys can be hardened and tempered, but the hardness attained is never of the same order as that of steel

metals and alloys, but the X-ray spectrometer and its allies have made it possible to study the arrangement of the very atoms of which the crystals are built. On

(Concluded on page 1014)

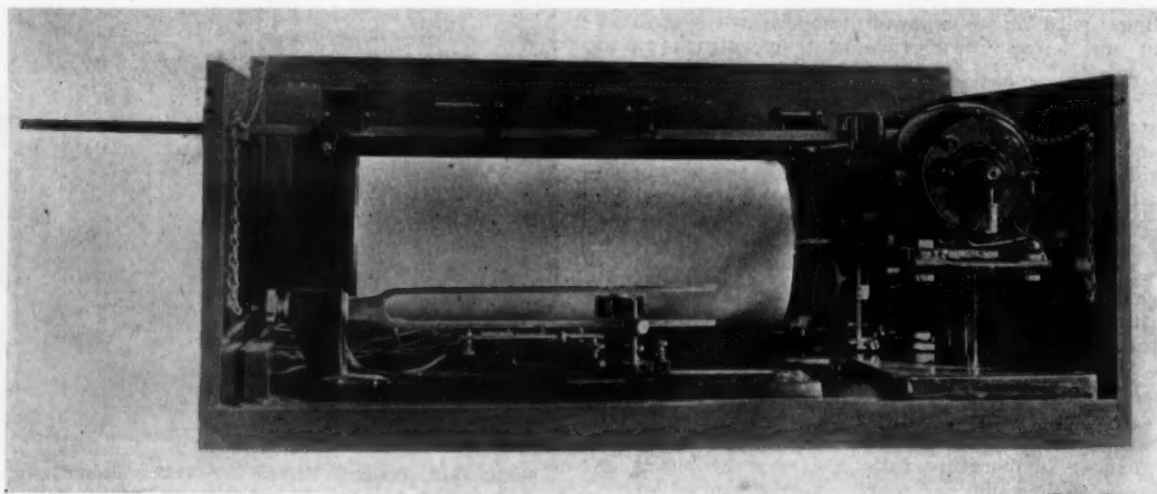


FIG. 6.—Plotting Chronograph for the Direct Recording of Large-Scale Inverse Rate Thermal Curves Direct from Observations of Galvanometer Movements. A small "phonic" motor is controlled by the tuning fork seen in the foreground and this automatically controls the larger motor used for driving the instrument, which thus acts as an accurate clock. The pen, seen above the recording drum, moves steadily from left to right until the observer taps the key, when the pen makes a mark and is immediately returned by quick motion to zero, while the drum is advanced one step. The pen begins a fresh journey which continues until the key is again tapped

LABOR: EMPLOYMENT—EARNINGS—EFFICIENCY

1. Employment in the United States increased 1.6 per cent in February. This is a little more than the usual seasonal gain, and the adjusted index therefore increased from 112.8 in January to 113.3 (the 1921 average being 100).

2. After the usual seasonal slump in January, the per capita earnings average recovered strongly in February, advancing 4.9 per cent.

3. In February the cost of living index

dropped about 1.1 per cent. As dollar earnings increased, "real wages" gained considerably.

4. At the beginning of 1925, production, when compared with number of laborers employed, was about 5 per cent greater than at the beginning of 1924.

5. An easy labor market should exist throughout the year, but no general wage reduction is yet in sight.

BY DR. LEWIS H. HANEY

Director, New York University Bureau of Business Research

General Labor Situation

JUDGED statistically, the outstanding facts about the labor situation as it existed in February—the latest month for which data are available—are as follows:

Labor is not fully employed. In fact, there is still considerable unemployment. According to reports issued by the United States Department of Labor, approximately 2 per cent of the manufacturing plants of the country are idle. Of the plants which are in operation, 55 per cent are working with only a part of their normal forces. Moreover, 29 per cent of the plants in operation are working on part-time schedules. Obviously, with a number of plants closed down and with those which are in operation running to a large extent with only a part of their ordinary labor forces, there must be some unemployment.

From the Illinois Department of Labor we get the report that in Chicago there were 176 applicants for every 100 jobs available at the public employment offices, and the

number of applicants per job was still greater in towns in the southern part of Illinois.

Perhaps the story is told as forcefully as possible in the fact that in February the number of employees in the great industries of the United States, and the total payrolls in those industries, both averaged approximately 4.5 per cent under the totals for the same month a year ago.

Unemployment, however, has been steadily reduced during recent months. This tendency probably is evidenced in the fact that January figures showed the total volume of employment to be 5 per cent less than in the same month of 1924 (instead of 4.5 per cent, as in February). Employment indexes with substantial unanimity show that the number of employees is on the increase, and, according to the United States Bureau of Labor statistics, February employment was 1.6 per cent above that in January (see Fig. 2).

The Illinois free employment office reports that, while there were 188 applicants for each 100 jobs during January, in February the figure was reduced to 174. (The

February figure, however, was 19 points above the showing made in February, 1924.)

The average earnings per laborer, on the whole, show an upward trend (Fig. 1). The United States Labor Department reports an increase for February of 4.9 per cent. The percentages of increase reported for the States of New Jersey, Pennsylvania and Illinois were, respectively, 2.8 per cent, 1.9 per cent, 1.8 per cent. In New York and Massachusetts the average weekly earnings of factory workers in February were actually a little lower than in January, but it is possible to make allowance for the seasonal variation in these States, and, when this is done, it is found that the average earnings remain practically unchanged. In other words, the small reduction was a purely seasonal affair. Inasmuch as there have been wage reductions in the textile and boot and shoe plants in these States, this may be called a favorable showing.

An unusually sharp reduction in the cost of living has been one of the outstanding developments of the recent industrial situation.

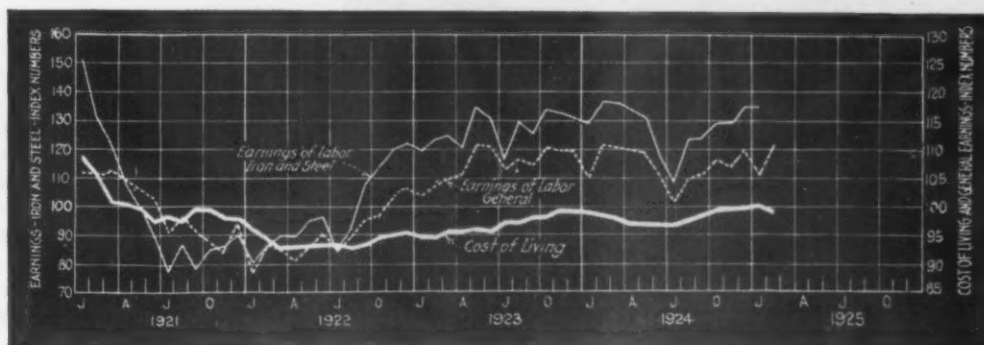


Fig. 1—Money Wages Rise; Living Costs Decrease; Real Wages Show Sharp Gain

The curves showing per capita earnings of labor are based on the United States Bureau of Labor Statistics reports. The cost of living index is that reported by the National Industrial Conference Board. All index numbers are based on the 1921 monthly average as 100

In January the National Industrial Conference Board's index showed that the average cost of living was practically the same as the average for the year 1921, being only 100.2 on the 1921 basis. In February it dropped to 99.1, the chief item of decrease being food. Clothing was also a little lower. With grain prices on a more reasonable basis and with the probability that cotton and wool will not rule any higher, the outlook for a more favorable basis for living costs is good.

Compared with a year ago the ratio of the index of living cost to the index of weekly earnings shows little change. Putting all the figures on a 1921 basis we find that the ratio in February, 1924, was as 98.3 to 110.6, while in February, 1925, the ratio was as 99.1 to 111.

Production has increased with unusual rapidity in comparison with employment, which means that the average output per laborer has gained. Between July, 1924, and January, 1925, the production in manufacturing industries increased nearly 28 per cent, and the output of all basic industries, including petroleum and coal, increased over 34 per cent. During the same six months the employment of labor as reported by the United States Bureau increased only 6.8 per cent.

This situation is brought out very forcibly in Fig. 3, which shows that the ratio of production to employment in manufacturing has increased greatly during the last year. In January, 1924, this ratio was 124.5, while in January, 1925, the ratio had risen to 132.3. In the middle of 1924 it was actually as low as 107.8. In other words, in January the average employee was helping to produce something like 5 per cent more goods than at the beginning of the preceding year.

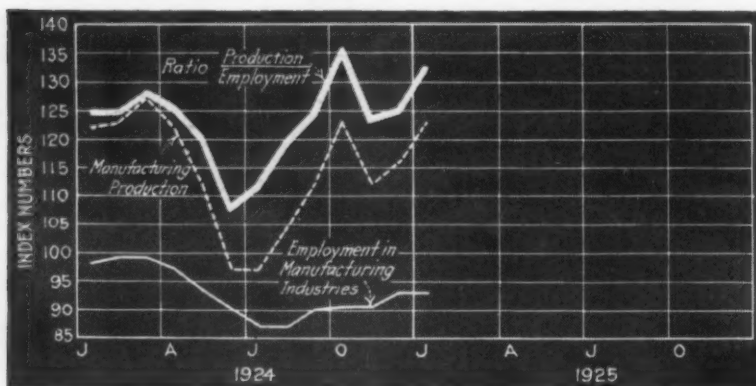


Fig. 3—Labor's Productive Efficiency Higher Than Year Ago

The curves are based on the data of the Federal Reserve Board. The index numbers are based on 1919 at 100 and are not adjusted for seasonal variation

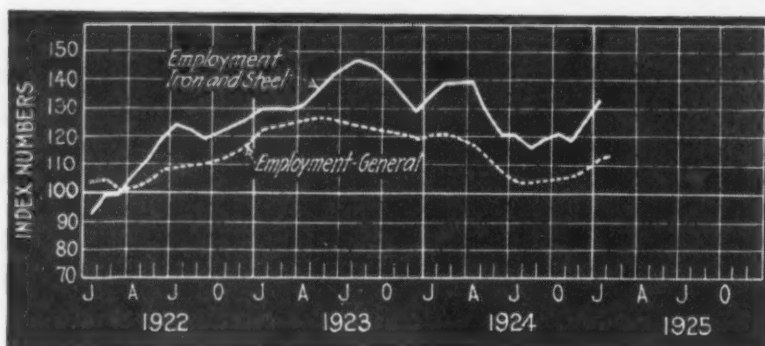


Fig. 2—Labor Demand More Active in Iron and Steel Than in Average Industry

Indexes based on United States Bureau of Labor Statistics report. They are adjusted for seasonal variation and consequently show the true trend from month to month

The labor market is relatively stable. It seems fair to characterize the labor market as rather stable, but on the whole fairly easy. This is due to the abundant supply of labor, which has already been discussed. In view of the present trend toward curtailment in the steel industry, no strain in the labor market appears likely for a good many months. It seems safe to say that no tendency toward generally advancing wage rates will develop this year. The majority of recent changes in wage rates have been downward (in textiles, boots and shoes, coal and coke, and furniture). Production appears to be near its peak.

While it would seem that the present is a good time to adopt policies and make agreements looking toward a reduction of labor costs, there is yet no indication that a general reduction of wage rates is likely to occur in the near future. It is to be remembered that unemployment normally hangs on for several months after a period of depression and would probably exist to some extent now even if the outlook for the future were brighter than it appears.

The industrial output is relatively large and business continues at a high level. The margin between cost of living and earnings, while large in comparison with earlier periods, is no greater than it was a year ago. Even granting the truth of the statement sometimes made that "wages are too high in this country," it does not seem that the time has yet come when wage rates can be materially reduced.

Employment Data Concerning Iron and Steel

FROM miscellaneous official sources have been gathered the following items of interest to anyone concerned with labor conditions in the iron and steel industry.

In Massachusetts, the index of employment in foundry and machine shop industries showed a considerable gain in February which contrasts with a decrease in February last year. The index numbers, based on the average for 1922 as 100, are: January 99.6, February 101.7.

In New Jersey gains are reported in all branches of the iron and steel industry, ranging from a small increase of 0.9 per cent in foundries and machine shops, up to 2.9 per cent in structural iron works.

Pennsylvania also reports gains in most branches in the iron and steel industry, the smallest increase in employment being found in iron and steel forging, with large increases in heating appliances, foundry and machine shops, and blast furnaces.

From New York State the reports are less favorable. The following statement is made by the Department of Labor: There was an "end of large increases in steel

In This Issue

Pig iron output falls off slightly.—March daily output estimated at 113,613 tons, one per cent under February rate.—Page 992.

Special tools save cost of special machines.—Standard machine tools may be adapted to special purposes by employing proper tool equipment, thereby avoiding cost of special machinery.—Page 960.

Do consolidations mean higher prices?—At Bethlehem merger hearing steel manufacturer says, "... consolidations mean higher prices, probably more stable prices, elimination of individuality . . ."—Page 961.

To reduce cost of cleaning castings.—Careful study to determine the most suitable core sand mix and the right core oil pays in easier removal of cores and quicker cleaning. Placement and design of core wires are important factors.—Page 971.

Germany secures contract to build ships for Scotch firm.—Hamburg builder's price £60,000 per vessel under lowest British bid.—Page 991.

America's position in the export market steadily improving.—High interest rates and taxes abroad, mounting wages and lessening disparity in exchange are bettering the American manufacturer's prospects for world export business.—Page 963.

Labor is earning more and producing more.—Though the cost of living decreased 1.1 per cent in February, earnings per worker increased 4.9 per cent. Production per worker 5 per cent higher than one year ago.—Page 980.

Exports lower, imports higher.—February exports of iron and steel totaled only 101,665 tons, lowest in three and one-half years. Imports were 92,373 tons, highest in two years.—Page 1015.

Exodus of skilled workers worries English manufacturers.—Unsettled industrial conditions accountable for emigration. More than half the workers come to United States.—Page 964.

Foundry business.—February rate of operations 71.4 per cent as compared with 70.7 per cent in January for Ohio foundries. Malleable foundries reporting to Washington operated at 53.4 per cent of capacity in February, falling off from the 59.5 per cent rate for January.—Page 993.

Two per cent of plants idle.—Government investigation reveals that 98 per cent of manufacturing plants are operating, though less than half have normal force of workers employed.—Page 983.

Steel plate fabricating business recedes.—February bookings of manufacturers reporting to Washington were 23 per cent under January.—Page 968.

Increase in employment.—More than the usual seasonal gain is shown in the 1.6 per cent increase in February employment over January.—Page 979.

Automobile is making heavy inroads on railroad passenger traffic.—In past 12 years relative amount of passenger travel has decreased nearly 25 per cent.—Page 985.

Avoid the risks of price-gambling for export business.—Foreign Commerce Department chief tells manufacturers that good quality, just terms, and keeping delivery promises are major factors in insuring for America her share of export business.—Page 963.

Suggests solution to the surplus productive capacity problem.—Discard obsolete manufacturing equipment, and thus reduce production costs. This will lower prices, and in turn increase demand.—Page 957.

Proper flask design cuts foundry costs.—Defective castings are reduced and output per molder increased by designing flasks to conform closely with contour of patterns.—Page 970.

India and Canada alter import tariff.—Machinery and railroad material tariffs lowered by India. Iron and steel hardware and automobile rates increased. Canada imposes penalty on steel imports sold for five per cent less than appraisal value.—Page 974.

CONTENTS

April 2, 1925

Net Profits from Modern Equipment 957

Lowering Production Cost to Get Lower Selling Price, Increased Consumption and Better Net Profits—Examples of Progressive Policy

Production Equipment in Iron Foundries 969

Value of the Use of Machines for Molding—Flasks and Their Handling—Core Making—Cleaning Castings

Metallurgical Research in England 975

Buildings and Equipment of a Celebrated Institution, the National Physical Laboratory—Some of the Work Done in Metallurgy

Labor: Employment—Earnings—Efficiency 979

Employment in the United States Increased—Per Capita Earnings Recovered Strongly—Cost of Living Index Dropped

The Coming Conflict in Foreign Trade 963

Swedish Iron and Steel Plant 965

Six-Block Continuous Wire Drawing 972

Iron and Steel Production of Small Countries 983

European Steel Markets Dull but Firm 991

March Pig Iron Output 3,522,000 Tons 992

Iron and Steel Imports Close to Exports 1015

Distribution of American Steel Exports 1017

Bethlehem Merger Hearing..... 961

Elimination of Varieties of Sheet Metal. 961

Skilled Labor Coming to the United

States from England..... 964

Standardization of Cast Iron Pipe..... 964

Serious Competition from German Man-

ufacturers of Methanol..... 964

Planer Builder to Erect New Plant..... 964

Bolt and Nut Packing Standards..... 971

College Men in Industry..... 974

New Tariff Laws in Canada and India.. 974

Correspondence 986

Making Term Contracts for Ore..... 988

New York Export Market..... 988

High Production of Steel..... 988

Republic Sells Its Last Bar Iron Mill... 989

Pittsburgh Piping Companies Combined. 989

Pittsburgh Coal Co. Abandons 16 Mines. 1007

Anti-Dumping Act Scrutinized..... 1014

French Market Not Active..... 1018

Belgian Market Still Weak..... 1019

Book Reviews 1021

New Trade Publications..... 1022

Plans of New Companies..... 1023

Trade Changes 1023

Steel and Industrial Stocks and Fi-

nance 1024

Iron and Steel Markets..... 994

Comparison of Prices..... 995

Prices Finished Products... 1008

Prices of Raw Materials, etc. 1009

Non-Ferrous Metals..... 1011

New York Jobbers' Prices... 1034

STATISTICAL

Machinery Exports to Germany Climbing to Pre-War Figures..... 968

Fabricated Steel Plate Bookings..... 968

Production of Pig Iron in 1924..... 993

Production of Malleable Castings..... 993

Rolled Zinc in 1924..... 1007

German Iron and Steel Trade..... 1016

Russian Iron and Steel Output..... 1020

Belgian Iron and Steel Output..... 1020

German Electric Steel Since the War.. 1021

MEETINGS

Employers Will Hear Lecture of Dr.

Dyer by Radio..... 964

American Electrochemists 971

American Refractories Institute..... 974

Coming Meetings 987

Institute of Steel Construction..... 989

Philadelphia Foundrymen's Association. 1007

NEW EQUIPMENT

Improved Jig Boring Machine..... 962

Machine for Reconditioning Friction

Saw Blades 966

Gleason Spiral Bevel Gear Generator... 966

High Production Planer..... 967

Horizontal Boring, Milling and Drilling

Machine 968

Large Pipe Bending Machine..... 990

Editorial 984

Railroad Equipment Buying. 1010

Fabricated Steel Business... 1010

Personal 1012

Obituary 1013

Machinery Markets..... 1025

mills which up to this time have been expanding operations more rapidly than in other industries. Steel is about where it was a year ago. The gain this month was quite small." Also the New York report refers to "the absence of any general improvement in railroad equipment and repair shops and to a halting in the extension of operations in steel mills at Buffalo."

In Illinois, metal industries led the advance in employment in February. The largest gain occurred in automobiles and automo-

bile accessories (11.6 per cent). Gains between 2 and 3 per cent in employment are reported for iron and steel, machinery, and agricultural implements. The Illinois Bureau says: "In the agricultural implement industry the enlargement in the payrolls of recent months has been steady and substantial, and operations are now 47 per cent above the low point reached in August, 1924. Operations in the car manufacturing plants are mounting slowly, the increase in February being 1.4 per cent."

Industrial Activity in February. A good general idea of industrial activity in February may be obtained from the following Bureau of Labor statistics data:

Plants idle 2 per cent

Plants operating (98 per cent):

Full time, per cent.....70

Part time, per cent.....29

Full labor force, per cent...43

Part labor force, per cent...55

Average employment condition of all operating plants reporting:

Full labor force, per cent..83

Full time, per cent.....93

The Iron Age, April 2, 1925

Iron and Steel Production of Small Countries

Figures for 1924 Show Gain Over 1923 in Most Cases—Total for World Outside the United States Records a Distinct Gain

SUPPLEMENTING the tables on page 333 of the Jan. 29 issue of THE IRON AGE, figures now have been gathered for the production of pig iron and steel in most of the smaller countries of the world, and estimates made for those whose production figures are missing. The results are shown in the table herewith which, for the sake of completeness, includes also a restatement of the production figures for the larger producing nations. Some of these latter figures have been revised in the light of later information than that available in January.

Figures are given here for the years 1923 and 1924 only. They cover the production of pig iron, of raw steel (ingots and castings combined) and of rolled iron and steel. All of the European producers are included, though figures so far are lacking for some of the small outside producers, including China and Mexico.

It may be noted that both France and Luxemburg made more pig iron than steel and that France, the

second largest producer of pig iron in 1924, was the fourth largest steel producer, having been exceeded heavily, in that respect, by both Germany and Great Britain. Italy's great preponderance of steel over pig iron—nearly 5 to 1—may be ascribed perhaps to the use of the electric furnace in making "new steel from old."

Freight traffic in January is reported by the Bureau of Railway Economics at 37,035,162,000 net ton miles. This is the greatest figure on record for any January except that of 1923, which exceeded it by 1.8 per cent. The increase over January, 1924, was 7.3 per cent and over 1920 was 5.9 per cent. The daily average movement per freight car in January was 26.5 miles, compared with 25.8 miles in January, 1923, which was the highest figure for any preceding January. The average load per car was 28 tons, compared with 29 tons in January, 1923.

Pig Iron and Steel Production of the World

	Pig Iron		Steel		Rolled Iron and Steel	
	1924	1923	1924	1923	1924	1923
Austria*	390,000	344,096	550,000	499,442	400,000	364,930
Belgium*	2,808,000	2,188,128	2,860,540	2,285,892	2,579,340	2,261,112
Czecho-Slovakia*	1,050,000	800,000	1,350,000	1,000,000	1,000,000	750,000
France*	7,656,939	5,299,581	6,906,502	4,976,869	5,100,000	3,700,000
Germany*	7,188,000	4,936,340	8,400,000	6,305,250	6,300,000	4,750,000
Great Britain.....	7,318,900	7,438,500	8,221,200	8,488,900	5,870,000	6,063,700
Hungary*	200,000	200,000	300,000	300,000	225,000	225,000
Italy*	267,000	236,000	1,179,000	1,219,000	880,000	900,000
Luxemburg*	2,173,216	1,406,666	1,886,084	1,197,739	1,400,000	900,000
Poland.....	500,000	492,000	950,000	935,000	710,000	700,000
Russia*	435,000	386,208	825,000	724,586	630,000	554,266
Sweden*	507,800	282,600	495,500	270,700	330,700	200,300
Total Europe.....	30,132,000	23,753,000	33,528,000	27,903,000	25,123,000	21,136,000
Canada.....	593,024	880,018	650,690	884,770	440,000	660,000
United States.....	31,504,790	40,310,485	38,000,000	44,943,696	27,900,000	33,277,076
India.....	550,000	536,000	.....	.....	.....	.....
Japan.....	.....	.....	550,000	500,000	410,000	370,000
Total listed.....	62,775,000	65,479,000	72,729,000	74,231,000	53,873,000	55,443,000
World† (Outside the United States).....	32,000,000	25,900,000	35,450,000	30,000,000	26,500,000	22,700,000

*Metric tons; all others are gross tons; totals are gross tons, the metric quantities having been translated for addition.

†With estimates for missing countries.

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY

WILLIAM W. MACON
C. S. BAUR, *General Advertising Manager*

GEORGE SMART

Member of the Audit Bureau of Circulations and of
Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President*

PRINTED IN U. S. A.

George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. Charles G. Phillips, *Pres.* A. C. Pearson, *Vice-Pres.* F. J. Frank, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: Guardian

Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Bldg. Buffalo: 833 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St. London, Eng.: 11 Haymarket S.W.1.

Subscription Price: United States and Possessions, Mexico, Cuba, \$6.00; Canada, \$8.50; Foreign, \$12.00 per year. Single copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

The Stock Market Decline

THE stock market has shown further and more drastic declines in the past week, and on Monday many of the issues listed on the Stock Exchange made new low records for the year. The continuance of the downward movement has caused further discussion of its bearing on the course of industry. We see no reason to change the view expressed on this page last week that rather than forecasting a recession in industrial activity Wall Street is now engaged in readjusting prices reached in a wild speculation, to bring them into agreement with the facts about business and business prospects.

In the first place, there had been nothing more than a moderate increase in industrial activity; there had been nothing in the nature of manufacturing excess or the accumulation of large unsold stocks of goods. The bull movement in wheat had been based on the prospect of insufficient supply, which remains unchanged. The bull movement in stocks had been based partly on the prospect of increased buying power from the Western farmers, but more largely on the assurance produced in the minds of investors by the election.

Speculators were naturally quick to take advantage of the change of sentiment, and pools bid many stocks to fantastic prices, being followed by the small fry, intoxicated by gambling fervor, upon whom the pools proposed eventually to unload as usual. The ordinary methods were employed to draw them on, such as intimations that the entire American people was going radio mad, wherefore buy radio stocks; or that the Diesel engine was going to revolutionize locomotive design, wherefore buy locomotive manufacturing stocks; none of which had any cool calculation as to prospective dividends.

Naturally there resulted a top-heavy speculative structure, which needed no more than a joggle to upset it. That may have been received from the Senate's behavior in the matter of the Warren nomination. The speculative decline in wheat may have precipitated the speculative decline in stocks. And all of this may have happened without impairing the sound sub-structure.

The froth has been blown off the stock mar-

ket. We shall see less pyramiding of chips and ought to be thankful for the change. We ought to see continued appreciation in the value of railroad, public utility and the well-seasoned industrial stocks, to the extent that their annual dividends will figure upon their market prices in the ratio that the consensus of opinion decrees, which may be from 6 to 7 per cent. Some stocks already have been discounting, and will continue to discount, prospective conditions, favorably or adversely. Thus the shares of a brimstone company have been discounting the prospective exhaustion of the supply of its principal competitor. The shares of lead producing companies have been discounting continuance of the world-wide shortage of lead. On the other hand, woolen manufacturing companies have been discounting unfavorable conditions.

There will always be such different movements, and also those reflecting peculiar conditions such as obtain with the St. Paul Railway. It is understanding in respect to such and the exhibition of proper discrimination that distinguish the investor or speculative investor from the gambler pure and simple.

We may consider that the gambling market of 1924-1925 has ended. We may reasonably look forward to a continued good market for investment and speculative investment purposes. We see no reason to subscribe to the pessimism that our national economy is going to the dogs, for there is positive evidence to the contrary. Without any doubt we still suffer from grave economic evils, but they are of such a nature as to be very slow in their motion and unlikely to play any controlling part in our markets in the immediate future.

Rising Pig Iron Imports

FOR the first time in many months American imports of iron and steel products have approached within 10 per cent of the export figure, imports in February having been 92,373 tons and exports 101,665 tons. More than half of the imports were pig iron, of which 45 per cent came from India. Not since January, 1923, has there

been so close a balance between ingoing and outgoing shipments. At that time pig iron again was responsible for the high import figures, amounting to 83,935 tons of the total of 120,078 tons. Exports in that month were 123,190 tons, leaving an excess of only 3112 tons. Close approaches in tonnage of imports to exports were made also in the September-October period of 1922, when the excess of exports in two months was only 10,920 tons.

Going back to November, 1903, we find iron and steel imports 50 per cent in excess, or 45,565 tons against 30,290 tons of exports. For the 19 months preceding that November, imports exceeded exports in every case, due to a large wave of incoming pig iron similar to that of two years ago and to that now gaining momentum. But the great import movement of 1902 and 1903 was due to causes having no parallel in the situation today, chief among them being the anthracite strike of 1902 and for many months a break-down of transportation facilities in important producing districts.

Steel Corporation Earnings

FROM 1923 to 1924 the earnings of the United States Steel Corporation, after payment of subsidiary company bond interest, decreased 14.7 per cent, while the steel shipments decreased 19.8 per cent. Thus the earnings per ton increased 6.2 per cent. There was not much change in manufacturing cost, and the course of prices in the open market would hardly have foreshadowed such a showing. Price advances ceased in April, 1923, while declines began early in 1924. The long drawn out influence of old sales must have been important, much material being delivered during 1923 at far below the current market, and no little, particularly construction material, delivered at prices above the current market in the following year.

Dividing the tons shipped into the earnings gives quotients of \$12.50 for 1923 and \$13.28 for 1924. The averages of similar quotients have been \$12.71 for the years 1902 to 1914 inclusive, \$16.48 for the four war years, \$11.70 for the six post-war years and \$13.12 for the entire 23 years of the corporation's existence.

So much is said about the Steel Corporation's profits from "other operations" that there may be criticism of this per ton computation. It must be granted that for comparison between years the analysis is useful and can hardly be misinforming. Too much, however, may be made of these "other operations," for in chief part they are operations conducted also by various other steel producers, particularly the making of coke and the mining and lake transportation of ore. No one can say where the line should be drawn between refinements of this sort that are natural and refinements that are unusual or exclusive.

There are, as a matter of fact, other uncertainties or divergences that affect the quotient more than do the really "outside" operations. In 1924 the corporation produced 61,982 tons of zinc, 36,079 tons of sulphate of iron, 15,748 tons of "duplex basic phosphate" and 15,156,000 barrels of

Portland cement. Certain profits were made, but on the other hand, 612,326 tons of blooms, billets, slabs and sheet and tin plate bars were shipped, on which profits were lost by not carrying the material through to the finished products.

As to profits on coke by-products, that is what by-product ovens are for. Various independents have such ovens for precisely the same reason.

The computed average earnings per ton are only a composite, a composite weighted not according to the steel industry's tonnage, but according to the corporation's tonnage. The corporation makes more than 50 per cent of the rails of the country and less than 25 per cent of the sheets, and profits per ton are no doubt less on rails than on sheets.

Whatever the figure that may be taken as representing the Steel Corporation's advantage in cost over the average of the leading independents, the corporation's earnings in the past two years, both really good years from the standpoint of general industrial activity, have been small. At \$12.89 the average for these two years makes a particularly poor comparison with \$12.71 in thirteen years before the war, for the money will not go nearly so far in employment of labor or purchase of commodities. When the Steel Corporation with its advantages makes meager profits, the independents necessarily fare worse still.

Railroad and Automobile Travel

IN 12 years there has been a decrease of about 25 per cent in the relative amount of passenger travel on the railroads. The decrease is commonly attributed to the increased use of automobiles.

One might jump to the conclusion that people have been changing their trips from the passenger train to the automobile, i.e., going from the same place to the same place simply by a different mode of travel. No doubt that is true as to railroad suburban business, what is called "commuting," but it would be quite unsafe to generalize as to the long trips.

The broader aspect of automobiling is that it changes modes of life. One does not do the same thing by a different mode; he does different things. For instance, possession of an automobile may reconcile a family to living in an apartment, when otherwise they would insist upon having a suburban place. Similarly the traveling involved in frequent short automobile trips during the summer may cause the individual or family to renounce the long summer trip formerly desired.

All that is known positively is that in many cases the cost of automobiling has been saved out of something else. Various lines of business have not prospered as otherwise they would have done. Very likely railroad passenger traffic has suffered more than any other one thing.

The fact of a relative decrease in passenger travel is made clear by the statistics. To eliminate the influence of natural changes due to changes in the state of business and to the growth of population, passenger traffic may be compared

with freight traffic. This is done in the accompanying table:

Revenue Traffic—Class 1 Railroads			
	Freight Ton-Miles, Millions	Passenger Miles, Millions	Ratio, Passenger to Freight
Fiscal Years			
1911	249,843	32,371	0.129
1912	259,982	32,316	0.124
1913	297,723	33,875	0.117
1914	284,925	34,567	0.121
1915	273,913	31,790	0.116
1916	339,870	33,646	0.099
Calendar Years			
1916	362,444	34,586	0.098
1917	394,465	39,477	0.100
1918	405,379	42,677	0.105
1919	364,293	46,358	0.127
1920	410,306	46,849	0.114
1921	306,840	37,313	0.122
1922	339,285	35,470	0.105
1923	412,727	37,957	0.092
1924	391,000	36,150	0.092

There was a steady decrease in the ratio of passenger traffic to freight traffic through the year 1916, and then the decrease was turned by the soldier movement. In 1920 there was relatively more passenger traffic than in 1916, and in 1921, a year of depression, passenger traffic naturally decreased less than freight traffic. The most recent condition is indicated by the ratio seen for 1923 and 1924. One may take for the long-range comparison a ratio of 0.125 for the calendar year 1912 and 0.092 for the year 1924. This makes a decrease of some 25 per cent in the amount of passenger traffic relative to freight traffic.

Getting Body Sheet Costs Down

PRICES of automobile body sheets have declined so much in the past year in comparison with the other finishes that there is naturally search for the reasons. Naturally it will be said that there has been overproduction, due to the fact that so many sheet mills that previously produced largely if not wholly the common finishes, have entered the field of automobile body sheets in the past two years. But a decline of \$19 a ton, or from 5.35 cents, base (No. 22 gage), Pittsburgh, the price at the beginning of 1924, to the present level of 4.40 cents, would seem to call for some other explanation than increased production and sharpened competition. It was to be expected, indeed, that the drop in prices, which first was from 5.35 cents to 5 cents, then to 4.75 cents and finally to 4.60 cents, in the last nine months of last year, would eliminate considerable capacity on the score of costs and produce a condition that should have prevented the recent further recession to 4.40 cents.

It is not disputed that when automobile body sheets were at 5.35 cents early last year, they were not only out of line with ordinary black sheets, which at that time were at 3.75 cents, base, for No. 28 gage, but were high in the light of producing costs. These considerations prompted the first cut, which carried the market down about \$7 a ton. Evidently there still remained a margin of profit, because the subsequent cuts were frequent and there was no real stability short of a further drop of \$8 a ton. As few makers appear to have dropped out of the production of this grade of material, something must have happened to make profitable production possible at the latest level.

One explanation and seemingly a plausible one

is that the body builders are using heavier gage steel and there is some saving to producers through fewer passes in the mill, while the paints now used in finishes can be applied to a coarser surface than finishes formerly used, and this means less pickling and patent leveler expense, so essential to the fine surface required to hold the paint and varnish formerly used.

There has been resistance to higher material costs by the automotive industry for some time, for prices of automobiles have been conspicuously low. It has been said, indeed, that a better car at less money can be had today than was possible ten years ago, and the automobile stands out as one product that is selling below pre-war prices. Moreover, the steel industry, in meeting that condition, has shown again that profits can be made as well through reduced costs as by raising prices.

CORRESPONDENCE

Heat Treatment of Cast Iron

To the Editor: The writer read with some considerable interest the article appearing in the March 19 issue of THE IRON AGE entitled "The Heat Treatment of Cast Iron." In this article THE IRON AGE gives Mr. Grotts of the Holt Mfg. Co., Peoria, Ill., the credit for instituting pioneer work along these lines.

Mr. Grotts' work is unquestionably a step in the right direction, but it can hardly be called pioneer work, for all of these things were done to even a greater extent as far back as 1907. In experimenting with the results obtainable with permanent molds, the writer developed a method of producing cast iron that was capable of being tempered to a far greater extent than Mr. Grotts has succeeded.

At that time iron was produced, and can still be produced, that could be tempered anywhere from a machinable state to a non-crystalline hardness sufficient to permit cast iron to cut steel at speeds in excess of ordinary tool steel.

This work was given publicity at that time both in your magazine and in *Foundry*, and it was the subject of a patent taken out June 22, 1909, under the serial number 927,495.

This corporation owns and controls all of the patents relative to the art of permanent mold casting, and we should be glad to place such information as we have before Mr. Grotts, yourself or any other parties that may be interested in development work along these lines.

E. A. CUSTER, JR.

Manager, Schaap Iron & Steel Corporation.

Catasauqua, Pa., March 20.

Importing Pig Iron

To the Editor: A great deal has been written lately with regard to the importation of foreign pig iron. So far, it is largely the point of view of the producers that has been published, especially that of the merchant furnaces. However, like in everything else, there are two sides to this question, and it is the purpose of these lines to throw some light on the other side.

I admit that the importation of foreign iron has been against the interest of the pig iron manufacturers, as this iron has been sold at lower prices than the American product. But what about the foundries? Do they stand outside the American industry? Are not their interests as important as those of the pig iron manufacturers?

For the foundries and other consumers of pig iron, the fact that if prices for American pig iron go too high there is a check by the possibility of importation of foreign pig iron is a very healthy condition, which the tariff commission should well consider before taking any steps.

Statistics will show that the importation of foreign pig iron is by no means a permanent affair, but sporadic and only possible when prices here reach a certain level. The very fact that the costs of ore and coke are hardly any cheaper in Europe, that the freight rate from European to American ports will amount to \$3 or \$4 a ton, and that there is a duty of 75c. a ton serves in itself as a guarantee that those importations are only possible at certain times.

As regards European iron, the situation there changes frequently very quickly, and whenever there is a rise in the domestic market in one of the European countries exports cease. This explains, for instance, why about two years ago the largest part of iron imported from Europe came from France, and Germany was hardly competitive. Today French iron is far too high in price for export to this country, but German and Dutch iron are competitive.

A great deal has been said about pig iron importations coming under the anti-dumping law, especially with reference to Indian iron. So far, all investigations have shown that there has never been any dumping, and if, at any time, dumping could be proved, the Government has sufficient power under the present law to give immediate relief. However, all those familiar with conditions abroad know that pig iron has so far never been sold here at prices less than the sales price in the country of origin, and that, whenever the prices in the country of origin go up, without the American prices following, they are unable to obtain any more supplies.

Those people who immediately call upon the Government to take steps to prohibit import of foreign iron altogether entirely forget that there have been numerous instances in the past when Europe imported American pig iron, and it was not so long ago that the writer's firm, who now bring in pig iron from Europe, exported Alabama pig iron in very large quantities to the very same countries which are now shipping pig iron to us.

Take another instance: Large quantities of spiegel-eisen made in the United States are shipped constantly from this country to Europe and delivered to countries where the same quality of spiegeleisen is produced. However, through certain circumstances, the costs of production for American spiegeleisen are lower than in Europe, and if any European government would try to exclude American spiegeleisen, or put prohibitive duties on it, we would be the first to consider this an unwarranted and unfair action toward our trade.

Finally, let me state that the matter of importation of foreign pig iron and the harm it is doing has been grossly exaggerated. If anybody will take the trouble to analyze the importations, he will find that foreign pig iron is shipped to places only 50 to 150 miles from the port. The tremendous pig iron consuming industry in the interior cannot possibly be touched by foreign iron, as the inland freight will kill it. Even to such places as Philadelphia or Baltimore today, when American pig iron has gone back about \$1 a ton from the December-January price, business is impossible. It can be done in New England, because New England consumers are far from the place of production. However, when the new merchant furnace near Boston is finished, foreign iron will find it hard to compete, just as the new furnace in Utah has taken a part of the import business in pig iron on the Pacific Coast.

IMPORTER.

New York, March 30.

Cost of Electric and Open-Hearth Steel

To the Editor: Having read with interest the article by S. H. Bunnell, in THE IRON AGE of March 26, describing the Bosshardt open-hearth furnace, it seems that the statement made in this article, that "the operating cost of the furnace figured on the basis of American wages and fuel cost would be at least \$10 per ton below the cost of melting steel in the best electric furnace," is based on an insufficient knowledge of the subject and of the conditions in this country.

Bearing on this, large electric furnaces are about to be placed in one of our States, where electricity is

½c. per kwhr. and where a mixture of heavy meltnig scrap and steel turnings, suitably prepared, costs \$13.66 a ton. The entire cost with overhead of the ingots from the soaking pits, ready for the rolling mill, will be \$21.76 per ton. Just how an open-hearth, using cold heavy melting scrap costing \$16, can surpass this price by \$10 remains to be seen.

The further statement, that in the "Bosshardt open-hearth furnace unselected scrap of a grade impossible for electric practice can be reduced," etc., shows a rather immature knowledge of the basic electric furnace. Basic electric furnaces are today reducing the most miscellaneous steel, iron and malleable scrap, not only making ingot steel but also steel for castings, and bringing the phosphorus and sulphur content lower than any open-hearth with similar scrap—and degasifying to such a degree that even the specific gravity of the steel is greater than open-hearth of like composition.

Recently F. T. Sisco has also shown at length that electric steels have much less oxygen, carbon monoxide, hydrogen and nitrogen than open-hearth steels, and that the density of well-known electric steels is greater than that of open-hearth of like composition.

C. H. VOM BAUR.

Vom Baur Engineering Co.,
Woolworth Building, New York.
March 28.

Sipp Sensitive Drill Business Sold to Foote-Burt Co.

The quick-change speed sensitive drilling machine business of the Sipp Machine Co., Paterson, N. J., has been purchased by the Foote-Burt Co., Cleveland.

The Sipp line of sensitive drills includes three drilling sizes, each of which are available in single or multiple spindle type. An outstanding feature is the arrangement for quickly changing the speed of the drill, and another feature is the elimination of the quarter-turn belt. Ball bearings are used throughout. The heavier type machine can be furnished with power feed to the spindle and the lighter type with foot treadle feed, if desired. Unusual rigidity is claimed, as well as extreme sensitiveness through the efficient control mechanism.

With the acquisition of the Sipp line, approximately 16 different types of drilling machines are included in the line of the Foote-Burt Co. In addition, the company designs and builds drilling equipment of the single-purpose type for special work.

COMING MEETINGS

April

American Management Association. Sales Executive Division. April 7 and 8, Boston Chamber of Commerce, Boston. W. J. Donald, 20 Vesey Street, New York, managing director.

National Metal Trades Association. Wednesday, April 22. Twenty-seventh annual convention, Hotel Cleveland, Cleveland. L. W. Fischer, Peoples Gas Building, Chicago, secretary.

American Welding Society. April 22, 23 and 24. Annual meeting, Engineering Societies Building, New York. Miss M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

National Supply and Machinery Distributors' Association. April 27, 28 and 29. Annual convention, Ambassador Hotel, Atlantic City. George A. Fernley, 505 Arch Street, Philadelphia, secretary-treasurer.

Southern Metal Trades Association. April 28 and 29. Annual convention, San Antonio. W. E. Dunn, Jr., Atlanta, secretary.

New England Trade Conference under auspices of the Chamber of Commerce. April 29 and 30. Providence.

American Institute. April 27 to May 2. Exposition of Inventions, Engineering Societies Building, New York. Headquarters of institute, 47 West Thirty-fourth Street, New York.

MAKING TERM CONTRACTS

Changed Policy Reduces Buying of Lake Ore in the Open Market

CLEVELAND, March 30.—Lake Superior ore in a larger percentage than ever before will be shipped on term contracts this year. With the low ore prices that prevailed, it was a favorable time last year for consumers to make long time contracts and the open market buying in 1924 for only the current year's delivery was estimated at only about 1,750,000 tons. From the standpoint of the producer, there is an incentive to make term contracts for the reason that when ore prices are way down the producer may be able with the backlog of a long term contract for a certain ore to operate a mine at a profit by operating it at its maximum capacity, whereas were it operated at less than capacity the mine might show a loss.

The most conspicuous activity in long term contracts the past few months was a purchase of approximately 5,000,000 tons of ore around the first of the year by a Pittsburgh steel company, mention of which was made in THE IRON AGE of Feb. 5. It is understood that the buyer in this case placed this large tonnage because it was able to buy at as low or a lower price than it could mine its own ore and at the same time it will not deplete its reserves as fast as it would if it used only ore from its own properties. Other consumers owning mines are showing a similar disposition to

buy ore when the price is sufficiently attractive or as low as they can mine their own ore.

Buying ore by term contracts did not become very general before about 1916, although some term contracts were made as far back as 1895. Many of the earlier contracts were made at fixed prices usually 10c. to 25c. below the going price of the season and later many of the contracts were made on a sliding scale based on the season's prices. However, some of these sliding scale contracts proved bad bargains for the mining companies because high ore prices resulted in considerable increase in the deduction from the regular market price for the season and the advance in the season's price was fully offset by higher labor costs. On the other hand, some long term contracts have been favorable to the sellers, as it is stated that with the 80c. a ton reduction last year some ore shipped on long time contracts brought higher prices than the regular market price.

Some of the mining companies are getting away from the former plan of making term contracts based on the market prices for the season and are using various methods of basing prices in their term contracts. One recent plan that is meeting with favor is the basing of term contracts on the cost of labor at the mines.

Term contracts usually cover a period of from three to five years, although some have been made for 10 years. Buyers usually cover these contracts for about 65 per cent of their requirements and purchase the additional ore that they need in the open market as required.

STEEL IMPORTERS ACTIVE

New York Contractor Buys 6000 Tons of Belgian Reinforced Bars—China Inquiries for Rails

NEW YORK, March 31.—Importing continues a more active field than exporting, but while sales of foreign pig iron in the United States are declining, consumers are showing an increasing interest in European steel, principally structural material and bars, with an occasional order or inquiry for bands and similar products. The outstanding purchase of foreign material thus far this year is the award by the P. J. Carlin Construction Co., Grand Central Terminal, New York, of 6000 tons of deformed reinforcing bars to William H. Muller & Co., 11 Broadway, New York. The bars, which are for sewer construction for Brooklyn, are of open-hearth steel, American Society for Testing Materials specification, subject to Hunt's inspection. The material is being furnished by a Belgian mill, shipped over a period of six months, or longer. A previous purchase was made on this contract of 500 tons of bars from the Bethlehem Steel Co.

Considerable difficulty is understood to have been encountered in obtaining foreign open-hearth steel and strong efforts were made to secure a ruling from the city permitting the use of Bessemer grade made to A. S. T. M. specifications. Belgian material of Bessemer grade is understood to be obtainable at \$32 to \$33 per ton, c.i.f. New York, duty unpaid. This business was offered to American mills at 1.75c., Pittsburgh basis, or \$7 a ton below the domestic market level, and is said to have been placed at about \$10 less than the ruling Pittsburgh quotation.

Tonnages of foreign steel arriving at Atlantic ports, principally Boston, Philadelphia, and occasionally New York, range from 100 tons or less to as much as 500 tons in a shipment. While such arrivals are numerous, the total tonnage is apparently not large. At present, importers handling Belgian and French material seem to be in position to quote lower prices than sellers of German steel. The control of prices by syndicates in Germany has removed a number of products from competition in the United States.

Exporters have found Cuba an active market in the past few weeks, although a large part of current buying seems to be done in Europe. Among recent purchases in New York was an order for about 10,000

spools of barbed wire. According to exporters familiar with the Cuban market, American barbed wire is preferred to European.

Chinese trade is still limited by the rather wide difference in price ideas, as between American sellers and Chinese merchants. Buyers of galvanized wire shorts offer \$45 to \$46 per ton, c.i.f. China, which is too low to interest American mills able to secure better prices from domestic sources. Offers on second-hand material exceed \$27 to \$28 per ton, c.i.f. Chinese merchants still claim to be unable to ship into the interior with any assurance of safe arrival of the material. The Chinese Government is understood to have asked for prices on 20,000 tons of 60-lb. rails, bids opening April 7. Another inquiry from China for rails, bidding on which closed March 31, calls for about 16,000 tons of 80-lb. and 90-lb. sections.

The Japanese market continues quiet with a plentiful supply of light gage black sheets offered by merchants at less than the current import prices and tin plate available from stock at low prices. The current quotation on tin plate is \$5.90 to \$5.95 per base box, c.i.f. Japan, with some American mills holding to \$6. The Nippon Oil Co. is reported preparing to issue an inquiry for its usual requirements running close to 50,000 boxes. The inquiry of the Osaka Electric Railway for 10 miles of 91-lb. high T-rails, reported last week as in preparation, has been received.

High Production of Steel

The Weirton Steel Co., Weirton, W. Va., in March made a good showing for open-hearth steel production. The output was 58,180 tons of ingots, which is equal to 8310 tons per furnace. This is not a new world's record, but it is a very fine one. A Jones & Laughlin record made in 1910 was 33,354 tons by four furnaces, or 8338 tons per furnace. The Weirton record was made without changing the normal method of operation, coal being used exclusively as fuel.

Although this company does not issue a public statement of earnings, last year was a prosperous one for it, and earnings were good even during the third quarter, which was the worst period of the entire year with the steel industry at large. It is stated that profits for the first quarter of this year have been considerably in excess of the 1924 basis, despite the low prices on steel products.

LAST OF ITS BAR IRON MILLS

Republic Iron & Steel Co. Sells Plant at East Chicago, Ind.

CHICAGO, March 31.—Through the sale of its East Chicago, Ind., plant the Republic Iron & Steel Co. has disposed of the last of its bar iron mills. The purchasers, Briggs & Turivas, Chicago, dealers in scrap and salvaged material, have not yet announced their plans for the property, but it is assumed that the mill will be dismantled. A landmark in the Western iron and steel industry, the East Chicago mill was built about 35 years ago by Swarts & Nathan, dealers in scrap iron. Upon the failure of that firm the property was taken over by Parkhurst & Wilkinson, who operated an iron store on the North Side of Chicago and a wagon factory in Indiana. It again passed to new ownership and was known as the Inland Iron & Forge Co. when in 1899 it was sold by L. E. and P. D. Block, now chairman and president of the Inland Steel Co., and S. J. Llewellyn, now president Interstate Iron & Steel Co., Chicago, to the Republic Iron & Steel Co. The mill was one of 25 bar iron plants gathered together in the Republic company in April, 1899, the combined annual capacity being 1,000,000 tons of finished material. The original headquarters of the company were at Chicago. Later the chairman's office was removed to New York and that of the president and all operating officials to Youngstown.

The history of the corporation has been an uninterrupted retreat of bar iron output to make way for the steady increase in steel production. Most of the original 25 constituent plants have passed out of existence. A few have been converted to new uses. The Indiana works, Muncie, Ind., is now the Muncie bolt and nut plant of the Republic company. The Sylvan works, Moline, Ill., now rolls rail steel. The Brown-Bonnell works, Youngstown, Ohio, formed the nucleus of the present steel works of the Republic company in that city. A complete list of the 25 mills operated by the company in 1900, one year after their consolidation, follows:

Inland works, East Chicago, Ind.; Central works, Brazil, Ind.; Sylvan works, Moline, Ill.; Alexandria works, Alexandria, Ind.; Indiana works, Muncie, Ind.; Muncie works, Muncie, Ind.; Marion works, Marion, Ind.; Westernman works, Marion, Ind.; Wetherald works, Frankton, Ind.; Cleveland works, Cleveland, Ohio; Corns works, Massillon, Ohio; Leetonia works, Leetonia, Ohio; Toledo works, Toledo, Ohio; Andrews works, Youngstown, Ohio; Brown-Bonnell works, Youngstown, Ohio; Mahoning Valley works, Youngstown, Ohio; Sharon works, Sharon, Pa.; Eagle works, Ironton, Ohio; Mitchell-Tranter works, Covington, Ky.; New Albany works, New Albany, Ind.; Springfield works, Springfield, Ill.; Tudor works, East St. Louis, Ill.; Terre Haute works, Terre Haute, Ind.; Wabash works, Terre Haute, Ind.; Alabama works, Birmingham, Ala.

GREAT SAVING POSSIBLE

Lee H. Miller Addresses San Francisco Audience on Importance of Simplification

SAN FRANCISCO, March 25.—Declaring that a saving of \$100 per capita, per annum, is possible if the steel industry were to apply the principles of simplification as broadly as has the automobile industry, which last year effected an estimated saving, through simplification, of \$750,000,000, Lee H. Miller, Cleveland, chief engineer American Institute of Steel Construction, speaking, March 24, at the Palace Hotel here before an audience of 400 fabricators, engineers, architects, contractors, bankers and city officials, outlined the work of the Institute, and told his audience that the program of cooperation, that has been launched by the institute, will mean an annual saving of 12½ per cent, or approximately \$30,000,000, throughout the United States. Mr. Miller was the guest of the California Institute of Steel Construction while in San Francisco, and complimented the local fabricators on the work they are doing for simplification. A. T. De Forrest, vice-president United States Steel Products Co., presided as toastmaster at the banquet.

Those at the speakers' table were: A. T. De Forrest, United States Steel Products Co., toastmaster; Lee H. Miller, chief engineer American Institute of Steel Construction; John L. Clymer, executive director California Institute of Steel Construction; F. J. Koster, California Barrel Co.; Ralph McLeran, county supervisor and acting mayor; M. M. O'Shaughnessy, chief city engineer; George Tourny, president San Francisco Bank; H. J. Brunner, consulting engineer; C. C. Overmire, Moore Dry Dock & Shipbuilding Co.; Harry Mortensen, Mortensen Construction Co.; C. P. Hensley, Jones & Loughlin Steel Corporation; D. E. McLaughlin, Pacific Coast Steel Co.; D. H. Botchford, Columbia Steel Corporation; W. W. Dennis, Common Brick Manufacturers' Association; C. J. Maas, Judson Mfg. Co.

Member companies of the California Institute of Steel Construction, under the auspices of which the banquet was held, are as follows: California Steel Co., Central Iron Works, Dyer Bros., Golden West Iron Works, Golden Gate Iron Works, Herrick Iron Works, Judson Mfg. Co., Mortensen Construction Co., Pacific Coast Engineering Co., Pacific Coast Steel Co., Pacific Rolling Mill Co., Ralston Iron Works, Schrader Iron

Works, Moore Dry Dock & Shipbuilding Co., Western Iron Works.

On March 23 Mr. Miller made a technical address before the combined staffs of the local fabricators at the Palace Hotel, and on March 25 he made an informal talk at a luncheon at the Engineers' Club.

Pittsburgh Piping Companies Combined

A combination of the Pittsburgh Piping & Equipment Co., Pittsburgh, and the American Foundry & Construction Co., Pittsburgh, both engaged in the piping and power plant field, has been effected, under the name of the former. Present plant locations of both companies are to be dismantled and the property sold and the business concentrated at a new plant recently completed on the site of the former Epping-Carpenter works of the Worthington Pump & Machinery Corporation, running from Forty-first to Forty-third streets between the Allegheny Valley and the Baltimore & Ohio Railroad. The present location of the Pittsburgh Piping & Equipment Co. is at Thirty-fifth and Charlotte streets and that of the American Foundry & Construction Co. at 4700 Second Avenue, Pittsburgh. The company more than a year ago acquired the Epping-Carpenter plant, which since has been rebuilt with the exception of the machine shop. George H. Danner, who was president of the Pittsburgh Piping & Equipment Co., continues in that capacity in the new organization and Charles R. Rall continues as vice-president and treasurer. Morgan Schiller, formerly president of the American Foundry & Construction, becomes vice-president of the combined companies. W. R. Neely is secretary. Robert Whyte, who has been general sales manager of the American company, continues in that capacity with the combination.

"Wage Incentives" will be the topic of a conference of the production executives division of the American Management Association, 20 Vesey Street, New York, to be held in Chicago, May 21 and 22. E. C. Roth, manager wage rate department, Western Clock Co., La Salle, Ill., and H. D. Agnew, assistant superintendent of industrial relations, Western Electric Co., are among those on the program committee. Seventeen charts of recognized wage incentive plans will be exhibited and discussed.

LARGE PIPE BENDING MACHINE

Material from 3 to 8 In. Extra Heavy Bent Cold Without Filling—Operation Rapid

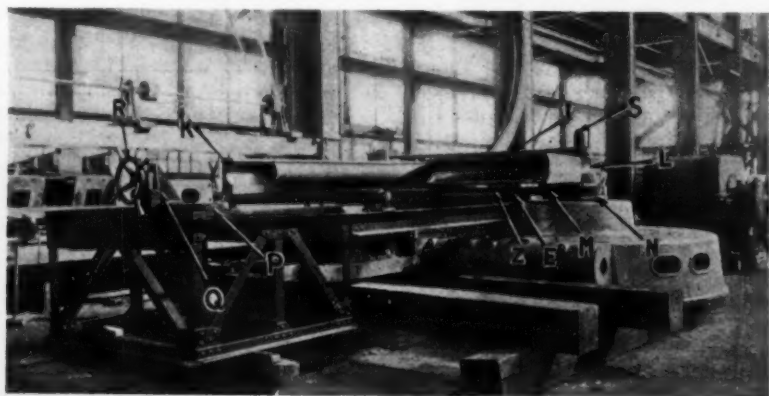
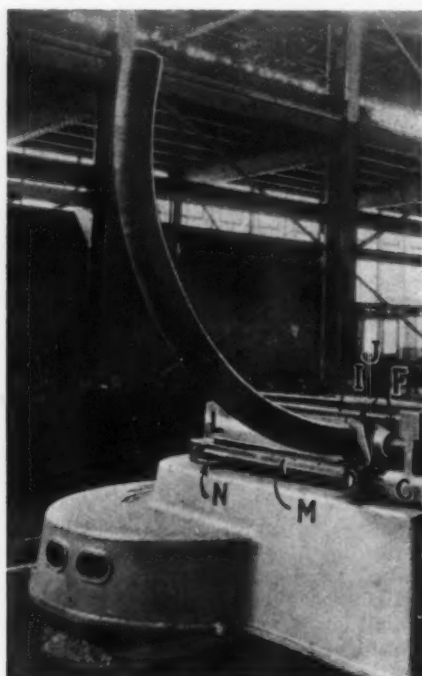
The pipe bending machine illustrated herewith, which is thought to be the largest machine of its type yet built, is intended for bending pipe ranging from 3 to 8 in. in diameter, extra heavy, making the bend cold without filling.

The photographic reproductions show the machine, which is for use by the Ford Motor Co., Detroit, as it was being demonstrated at the plant of the Federal Shipbuilding & Dry Dock Co., Kearny, N. J. The latter company built the machine for the Federal Bending Machine Co., Bayonne, N. J., owner of the patents. The time required to bend the length of pipe shown,

during the bending process and distribute the load between the main spindle *S* and the heads *C* and *G* respectively.

When the pipe is inserted in the machine in the position for bending, clamping screws are turned by means of a ratchet wrench, which forces the clamping and slide blocks *J* and *K*, respectively, by heads *D* and *F* against the pipe, and forces the pipe in place against the forming member *L*.

The motor is then started which causes the main spindle *S* to revolve and with it former *L* and the revolving arm *M*, the last two members being keyed to the spindle. The pipe, being fast in the former, is pulled around, and the bending process continues until the power is shut off by the operation of automatic stop *N*, which actuates a limit switch in the electrical control system. During the bending operation the straight section of the pipe is held in position by a slide



The Production Is Three 8-In. Pipe Bends An Hour, the Pipe Being Bent Cold Without Filling. Operation is simple. After the pipe is fed into the machine and clamped to the forming member, power is applied and the pipe travels with and around the forming member. A slide block moves along with the straight section of pipe, serving to reduce friction during bending

8 in. extra-heavy, to a 70 in. radius, was 40 sec., which does not include the time spent in putting the pipe into the machine or removing it after the bend was made. Production at the rate of three 8-in. bends per hour is guaranteed. The sample bends showed no flattening or wrinkling and when measured they were found to be $\frac{1}{8}$ in. off round. The machine is designated as the type F, and is claimed to make the usual types of expansion and return bends at a cost which will permit of using such pipe bends in many places where cost has heretofore dictated the use of cast-iron fittings.

The floor space occupied by the machine is 10 by 12 ft. A 40 to 45 hp. 1200-r.p.m. driving motor is employed and the drive, which is through two spur gears and two sets of worm gearing, the high speed set being a bronze worm wheel and hardened steel worm, develops a ratio of approximately 45 to 1. The large housing is of cast iron, the revolving arm is of forged steel and all heads, resistance and revolving arm are of cast steel. The weight of the machine is approximately 11 tons.

In operating the machine the hand wheels *A* and *B*, which are fixed to lead screws, are used to adjust heads *C* and *D* and *E* and *F*, respectively, to suit varying radii of bending tools. Heads *C* and *G* are tightened in position by set screws, after which the tie-rod nuts *H* are tightened, placing tension on the tie rods *I*. These tie rods take up some of the forces developed

block *K*, which travels with the pipe and relieves the friction between the pipe and the resistance head *F*. When the bend is completed and the machine stopped, the motor is reversed slightly to bring the revolving arm *M* back about 10 deg. In doing this the recoil of the pipe against the heads *D* and *F* is lessened, facilitating the loosening of the clamping screws, which are backed off to give ample clearance between the pipe and blocks *J* and *K*. The bent pipe is now forced out of the groove in the former *L* and the motor is reversed until the revolving arm reaches its neutral position, as at the start of operations. The bent pipe may be then removed easily from the machine.

The slideway *P* permits of lateral adjustment of the mandrel carrier *Q* to coincide with the bending tools of varying radii used on the machine. The position of the mandrel rod with reference to its exact location during the bending operation is controlled by handwheel *R*. The use of mandrel is necessary only when bends are being made to a radii six times the diameter of the pipe or less. When the mandrel is used the extension is fastened in a concrete foundation.

The Truscon Steel Co., Youngstown, will erect two warehouses on a parcel of land 400 by 150 ft. just leased at Bailey Avenue and William Street, Buffalo. One will be erected at once and another in the fall.

European Steel Markets Dull but Firm

England Reports Better Pig Iron Demand and Ship Orders
—Germany Competing in Ships—Belgium and
France in Poor Shape

(By Cablegram)

LONDON, ENGLAND, March 30.

THERE is marked improvement in demand for foundry iron and increased sales are reported both for domestic account and for export. Some makers now are well sold forward and are asking higher prices for deliveries beyond June. Export buyers are exhibiting considerably more interest. Hematite is dull, on account of the slackness of the steel trade, and prices are weak, owing to accumulations of stock. William Whitwell & Co., Ltd., Stockton-on-Tees, are blowing out two furnaces [out of three] at the Thornaby Ironworks. The Seaton Carew Iron Co., Ltd., West Hartlepool, is closing the only furnace still operating [the plant contains four].

Finished steel generally is quiet, especially ordinary merchant and export business, but there is a slight improvement in shipbuilding. The Australian Government has awarded to John Brown & Co., Ltd., Clydebank, Scotland, a contract for two light cruisers [of 10,000 tons displacement each, and mounting eight 8-in. guns], totaling £4,250,000 (\$20,300,000). The Anglo-Saxon Petroleum Co. has placed orders for four oil tankers, two to R. W. Hawthorn, Leslie & Co., Ltd., Newcastle-on-Tyne, and two to Palmer's Shipbuilding & Iron Co., Ltd., Jarrow-on-Tyne.

Sheets and Tin Plate

Tin plate shows improving domestic demand, especially for wasters. There have been some export sales, but the volume of tonnage placed was not large. Most makers now are asking above the schedule rate, but some still are willing to accept this figure.

Galvanized sheets are firm, without any improved demand.

Black sheets are quiet; the Far East is displaying practically no interest.

On the Continent of Europe

Continental markets are firm, but there is little increase in the volume of business through traders here. The works are reported well sold on orders for Southern Europe. India is deadily dull and Japan quiet.

In Germany the machine tool convention is being renewed. German locomotive makers have formed an association to control the distribution of orders.

Germans Underbidding for Ships in Great Britain

LONDON, ENGLAND, March 19.—The position of the British iron and steel industry has become more and more precarious and it is difficult to see how conditions can return to anything comparing with normal. The chief hindrance to improving trade is the question of costs, which are preventing our manufacturers from getting anything like their fair share of the world's trade.

This is forcibly shown in the case of a recent contract secured by competitors. The Furness-Withy Shipping Co. asked for tenders for five new motor cargo boats, each of 10,000 tons. They awarded the contract to a Hamburg shipyard at a price which works out at £60,000 less per vessel than the lowest British tender. This enormous difference can be explained only on the grounds of cheaper costs of manufacture. Nevertheless it has been an "eyeopener" to certain quarters, and various associations in this country are endeavoring to form committees to go into the matter fully and see if something cannot be done for the benefit of British shipyards. From all quarters we hear of bad trading conditions, and just now Richard-

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.78 per £1, as follows:

Durham coke, del'd..	£1 2s.	\$5.26
Bilbao Rubio ore†...	1 2½	5.38
Cleveland No. 1 fdy...	4 3	19.83
Cleveland No. 3 fdy...	3 18	18.64
Cleveland No. 4 fdy...	3 17	18.40
Cleveland No. 4 forge	3 16	18.16
Cleveland basic	4 0	19.12
East Coast mixed....	4 4	20.08
East coast hematite...	4 19	to £5 0s. 23.66 to \$23.90
Ferromanganese	15 0	to 15 10 71.70 to 74.09
*Ferromanganese	15 0	to 15 10 71.70 to 74.09
Rails, 60 lb. and up...	8 10	to 9 0 40.63 to 43.02
Billets	7 5	to 8 5 34.65 to 39.44
Sheet and tin plate		
bars, Welsh	7 17½	37.64
Tin plates, base box...	1 2½	to 1 2½ 5.29 to 5.44
Ship plates	8 15	to 9 5 1.87 to 1.97
Boiler plates	13 0	to 13 10 2.77 to 2.88
Tees	8 15	to 9 5 1.87 to 1.97
Channels	8 0	to 8 10 1.71 to 1.81
Beams	7 15	to 8 5 1.65 to 1.76
Round bars, ¾ to 3 in.	9 0	to 9 10 1.92 to 2.03
Galv. sheets, 24 gage	16 0	to 16 10 3.41 to 3.52
Black sheets, 24 gage	11 10	2.45
Black sheets, Japanese		
specifications	15 5	3.25
Steel hoops	10 15	and 12 10* 2.29 and 2.67*
Cold rolled steel strip,		
20 gage	16 0	3.41

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:(a)		
Belgium	£3 15s.	\$17.93
France	3 15	17.93
Luxemburg	3 15	17.93
Basic pig iron:(a)		
Belgium	3 14	17.69
France	3 14	17.69
Luxemburg	3 14	17.69
Billets:		
Belgium	5 5	25.10
France	5 5	25.10
Merchant bars:		C. per Lb.
Belgium	5 16	1.24
Luxemburg	5 16	1.24
France	5 16	1.24
Joints (beams):		
Belgium	5 10	1.17
Luxemburg	5 10	1.17
France	5 10	1.17
Angles:		
Belgium	5 18½	to £6 0s. 1.26 to \$1.28
½-in. plates:		
Belgium	7 0	1.49
Germany	7 0	1.49
⅞-in. ship plates:		
Luxemburg	7 0	1.49
Belgium	7 0	1.49

(a) Nominal.

sons, Westgarth & Co., marine engineers, have decided to shut down their department at Middlesbrough, and Swan, Hunter & Wigham Richardson, also have closed more of their works.

Continuous Chain of Price Reductions to Secure Business

The position in pig iron shows little change. By a succession of small reductions in prices ironmasters have been able to get selling prices down to lower levels, but even at these figures, namely, £3 17s. 6d. for Cleveland foundry iron, home consumers will go no further than covering their bare requirements. Export trade in pig iron is at the moment practically a dead letter.

Semi-finished steel also is weaker, but cannot well compete with the cheaper Continental product. In February over 100,000 tons of blooms, billets, slabs and sheet bars were imported into this country, mainly from Belgium, out of total imports of 234,853 tons.

Finished steel also is dull, particularly in heavy gages, and producers are making sacrifices by reductions in quotations for export, but even then have great difficulty in obtaining anything like a decent tonnage. Trade in galvanized sheets has been exceedingly slow and makers have now decided to reduce output. Business in tin plate has been held up for some time by the uncertainties as to the life of the stabilization scheme, but now that it has been decided that this is to continue until October, a little better demand is noticeable and prospects are brighter. Black sheets are, to all intents and purposes, a dead market.

Exports of pig iron and manufactured iron and steel from the United Kingdom in February were only 298,761 tons. In January they were 323,351 tons and in February of last year, 330,523 tons. Mills, therefore, are fortunate to a certain extent in having a fair amount of work on hand in connection with the railroad programs, but more orders would be welcomed on all sides.

GERMAN MARKET MORE ACTIVE

Many Concerns Have Orders for Months—Export Market Dull Except for Machinery and Railroad Materials

(By Radiogram)

BERLIN, GERMANY, March 30.—The market is more active. Demand for pig iron is reported increasing, also that for scrap. The chief steel making concerns have orders for months ahead and are refusing orders for prompt shipment. There is particular demand for thin sheets.

Prices per metric ton include blooms, 112½ gold marks (\$27.22 per gross ton); steel bars, 134 marks (1.45c. per lb.); thin sheets, 220 marks (2.39c. per lb.). The export market for iron and steel is dull, but foreign orders for railroad material and for machinery are increasing. Belgian and French makers are selling bars f.o.b. Antwerp, at £2 15s. per ton, against a German price of £3 10s. [These prices appear incredible; they represent respectively 0.59c. and 0.75c. per lb.]

A Russian official commission, after investigation on the spot, has pronounced Germany's production cost for machinery to be 20 to 30 per cent below that prevailing in England. Nineteen locomotive manufacturing concerns have formed a cartel with the aim of rationing orders and maintaining prices.

The Alabama Power Co. is building heavy transmission lines from Birmingham, Ala., to Oneonta, 20 miles distant, to meet the demand for heavy power, for the operation of brown ore mines where two washers will be run.

MARCH PIG IRON OUTPUT

Estimated Total 3,522,000 Tons—Daily Rate Slightly Below February

Preliminary estimates of the pig iron production for March, gathered by telegraph, show the output to have been about 3,522,000 gross tons, or 113,613 tons per day. The data received represent about 90 per cent of capacity active and take in practically all the steel companies. The above total compares with 3,214,143 tons, or 114,791 tons per day, for the 28 days of February. The March production was 4893 tons per day larger than that of January, both being 31-day months. An interesting feature was a rate of production in the Chicago district considerably in excess of that for January.

In March, 1924, the pig iron output was 3,466,086 tons (111,809 tons per day), and in March, 1923, it was 3,523,868 tons (113,673 tons per day), or 60 tons per day more than is shown by the estimates for last month.

Detailed pig iron statistics for March will appear in THE IRON AGE of April 9.

Varieties and Sizes of Milling Cutters Are Eliminated

WASHINGTON, March 31.—Thirty-five per cent of the varieties and sizes of milling cutters were eliminated from the existing catalog lists at a general conference here on Wednesday of last week of makers, users, government officials and technical society representatives. The meeting was held in the Department of Commerce building under the auspices of the Division of Simplified Practice.

With a view to developing further standards for this machine tool commodity, the conference named a standing joint committee to study technical and other problems and to effect a liaison with a standardization section which the American Engineering Standards Committee will create for the study of this item. Production on all but the simplified varieties will be stopped on July 1. The conference fixed Jan. 1, 1926, as the date for clearing away of the eliminated varieties from existing stocks and stores.

Keen Interest Shown Simplifying Sizes of Sheet Steel

WASHINGTON, March 31.—The National Association of Sheet and Tin Plate Manufacturers is broadcasting in printed form, for the benefit of those interested, the "simplified sizes" of sheet steel, the purpose being to promote their wider use. This simplified list, adopted through cooperation between the sheet steel industry and the Division of Simplified Practice, Department of Commerce, represents an elimination of more than 1550 size and thickness variations of steel sheets. The 263 retained sizes represent a large proportion of the demand. As a sequel to this action, the Division of Simplified Practice has been informed, the association is receiving a constant stream of requests for the "recognized list." At the same time it is receiving many constructive suggestions for further simplifications. These are being passed on to the Board of Review, or standing committee of the entire industry, which is considering the necessity of possible revisions. The findings of the Board of Review will be considered at the semi-annual meeting of the Metal Branch of the National Hardware Association of the United States, which will be held in Cleveland in May.

The American Committee of the Shipping, Engineering and Machinery Exhibition to be held at Olympia, London, Nov. 25 to Dec. 5, has been given only 5000 sq. ft. of the total reservation of 150,000 sq. ft. of exhibition space, all of the latter having been allocated and sold. R. G. Hollaman, 110 East Forty-second Street, New York, is the representative in this country.

PRODUCTION OF PIG IRON IN THE UNITED STATES IN 1924.

PRODUCTION OF PIG IRON BY GRADES, 1909-1924.

Years	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
1909.	8,250,225	10,557,370	5,322,415	658,048	725,624	281,789	25,795,471
1910.	9,084,608	11,245,642	5,280,447	843,123	564,157	305,590	27,303,567
1911.	8,520,020	9,409,303	4,468,940	612,533	408,841	229,910	23,649,547
1912.	11,417,886	11,664,015	5,073,873	825,643	469,183	276,337	29,726,937
1913.	12,536,693	11,590,113	5,220,343	993,736	324,407	300,860	30,966,152
1914.	9,670,687	7,859,127	4,533,254	671,771	361,651	235,754	23,332,244
1915.	13,093,214	10,523,306	4,843,899	829,921	316,214	309,659	29,916,213
1916.	17,684,087	14,422,457	5,563,644	921,486	345,344	504,779	39,434,797
1917.	17,671,662	13,714,732	5,328,258	1,015,579	345,707	545,278	39,621,216
1918.	18,646,174	13,024,966	6,145,260	1,117,914	393,932	726,398	39,054,644
1919.	14,494,131	9,975,934	4,916,758	1,009,049	271,286	348,206	31,015,364
1920.	16,737,722	12,062,084	5,957,782	1,310,951	318,048	539,400	36,925,987
1921.	7,753,071	5,595,215	2,568,136	457,340	112,748	201,616	16,688,126
1922.	13,841,367	7,813,203	3,976,431	1,051,495	214,210	323,198	27,219,904
1923.	19,795,590	11,677,509	6,470,013	1,571,064	327,430	519,540	40,361,146
1924.	15,999,012	8,172,297	5,623,124	973,158	255,961	382,238	31,406,790

PRODUCTION OF PIG IRON BY STATES, 1920-1924.

States.	1920.	1921.	1922.	1923.	1924.
Maine, Mass., Conn....	10,281	2,142	1,084	1,309	
New York, New Jersey..	2,601,134	968,660	1,772,325	2,951,810	2,013,673
Pennsylvania.....	13,983,134	6,252,766	9,731,788	14,804,620	11,068,979
Maryland.....	523,733	147,189	366,967	529,606	558,420
Virginia.....	429,302	67,239	49,024	276,874	97,739
Alabama.....	2,392,962	1,207,408	2,230,619	2,797,190	2,773,825
West Va., Kentucky....	772,379	264,759	460,311	702,454	568,031
Tennessee.....	283,207	19,479	123,907	250,982	137,991
Ohio.....	8,533,470	3,799,613	6,484,162	9,347,960	7,415,039
Indiana.....	3,280,875	1,612,033	2,625,244	3,839,063	2,600,864
Wisconsin, Michigan....	2,939,321	1,893,611	2,726,727	3,813,125	3,350,385
Mo., Iowa, Colo., Mont., Utah, Wash.....	711,405	226,863	381,030	724,717	357,271
	404,584	226,364	266,716	321,436	463,573
Total... Gross tons.	36,925,987	16,688,126	27,219,904	40,361,146	31,406,790

PRODUCTION OF PIG IRON BY STATES, 1923-1924, SHOWING INCREASE OR DECREASE BY STATES.

States.	Production—Gross tons.				
	1924.	Per cent.	1923.	Per cent.	Decrease.
Pennsylvania.....	11,068,979	35.24	14,804,620	36.68	3,735,641
Ohio.....	7,415,039	23.61	9,347,960	23.16	1,932,921
Indiana, Michigan....	3,350,385	10.67	3,813,125	9.45	462,740
Alabama.....	2,773,825	8.83	2,797,190	0.93	23,365
Illinois.....	2,600,864	8.28	3,839,063	9.51	1,238,199
New York, New Jersey..	2,013,673	6.41	2,951,810	7.31	938,137
West Va., Kentucky....	568,031	1.81	702,454	1.74	134,423
Maryland.....	558,420	1.78	529,606	1.31	*28,814
Mo., Iowa, Colo., Utah, Wash.....	463,573	1.48	321,436	.80	*142,137
Wisconsin, Minnesota....	357,271	1.14	724,717	1.80	367,446
Tennessee.....	137,991	.44	250,982	.62	112,991
Virginia.....	97,739	.31	276,874	.69	179,135
Massachusetts.....			1,309		1,309
Total.....	31,406,790	100.00	40,361,146	100.00	8,955,356

*Increase.

PRODUCTION OF COLD AND HOT AND WARM BLAST CHARCOAL PIG IRON, 1920-1924.

Kinds of iron.	1920.	1921.	1922.	1923.	1924.
Cold blast.....	1,734	350			
Hot and warm blast....	321,662	94,380	224,731	251,177	212,710
Total..... Gross tons.	323,396	94,730	224,731	251,177	212,710

(Compiled by American Iron and Steel Institute)

Production of Malleable Castings

February production of malleable castings, reported by the Department of Commerce, amounted to 60,220 tons from 143 plants, compared with 66,367 tons from 144 plants in January and with 66,637 tons from 131 plants in February, 1924. The current percentage of capacity is 53, compared with 57.6 last month and 62 one year ago. Orders booked during the month amounted to 49,673 tons, which is the smallest figure since November, whereas January orders at 61,140

PRODUCTION OF PIG IRON BY GRADES, 1923-1924, SHOWING DECREASE BY GRADES.

Grades.	1924.	Per cent.	1923.	Per cent.	Decrease.	Per cent.
Basic.....	15,999,012	50.94	19,795,590	49.05	3,796,578	19.18
Bessemer and low phos.	8,172,297	26.02	11,677,509	28.93	3,505,212	30.02
Foundry and ferro-silicon....	5,623,124	17.90	6,470,013	16.03	846,889	13.09
Malleable.....	973,158	3.10	1,571,064	3.90	597,906	38.06
Forge.....	255,961	.82	327,430	.81	71,469	21.83
Spiegeleisen.....	107,066	.34	129,686	.32	22,620	17.44
Ferro-mang.....	194,243	.62	247,031	.61	52,788	21.37
All other.....	80,929	.26	142,823	.35	61,894	43.34
Total.....	31,405,790	100.00	40,361,146	100.00	8,955,356	22.19

FIG IRON MADE FOR SALE BY GRADES IN 1924.

States.	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
New York, N. J., Md.....	109,460	182,772	819,217	183,186	326	12,112	1,307,073
Pennsylvania.....	449,620	309,946	942,352	70,860	83,870	113,888	1,970,536
Va., W. Va., Ala.....	41,561	212	1,477,360		29,473	14,997	1,563,603
Kentucky, Tenn.....			127,152	83		10,839	138,074
Ohio.....	673,347	11,680	720,944	278,937	9,531	4,659	1,699,068
Ind., Illinois.....	279,236	114,559	347,276	173,480			914,551
Michigan, Wis., Minn., Iowa, Mo., Utah.....	53,508		605,028	159,313			817,939
Total.....	1,606,822	619,139	5,039,329	565,859	123,200	156,495	8,410,844

METHODS BY WHICH ALL FIG IRON WAS CAST OR DELIVERED IN 1924.

States.	Molten condition.	Sand cast.	Machine cast.	Chill cast.	Direct castings.	Total. Gross tons.
New York, New Jersey, Md.....	1,046,070	163,661	1,309,317	52,112	933	2,572,093
Pennsylvania.....	7,710,883	311,676	2,888,911	153,895	3,614	11,068,979
Virginia, West Va., Ala., Ky., Tenn....	1,508,597	1,363,291	491,955	204,908	8,835	3,577,586
Ohio.....	4,336,562	136,647	2,932,240		9,590	7,415,039
Ind., Ill., Mich., Wis., Minn., Iowa, Mo., Colo., Utah....	4,190,822	255,289	2,310,273		6,709	6,772,093
Total.....	18,792,934	2,230,564	9,941,096	410,915	20,681	31,405,790

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Coke*.....	156	228	171	399	17,406,693	13,786,387	31,193,080
Anthracite†.....	0	0	2	2			
Charcoal.....	8	7	17	24	107,792	104,918	212,710
Total.....	164	235	190	425	17,514,485	13,891,305	31,405,790

*Includes pig iron and ferro-alloys made with electricity, electricity and coke, etc.

†Includes mixed anthracite and coke pig iron.

FIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN 1924.

Grades.	For sale.	For maker's use.	Total. Gross tons.
Basic.....	1,606,822	14,392,190	15,999,012
Bessemer and low-phosphorus	619,139	7,553,158	8,172,297
Foundry, including ferro-silicon.....	5,039,329	583,795	5,623,124
Malleable.....	865,859	107,299	973,158
Forge or mill.....	123,200	132,761	255,961
Ferro-manganese.....	54,638	139,605	194,243
Spiegeleisen.....	69,135	37,931	107,066
All other grades.....	32,722	48,207	80,929
Total..... Gross tons.	8,410,844	22,994,946	31,405,790

tons formed the largest figure since February, 1924. In a comparative summary for 130 identical plants over the past year February production is given as 56,399 tons, or 53.4 per cent of capacity, compared with 62,829 tons in January and with 66,436 tons in February, 1924. The current figure, with the exception of January, is the highest since last April. Orders booked, at 46,193 tons, showed the lowest total since September. The January figure was 58,047 tons, while for February, 1924, it was 62,593 tons.

Iron and Steel Markets

PIG IRON OUTPUT LESS

March Rate Somewhat Lower Than February Peak

Steel Consumption Maintained While Production Is Adjusted—Prices Irregular

The week has brought a further slight reduction in output of pig iron and steel, with indications of recession in the volume of new business and of weakening in prices for certain finished steel products. A readjustment of production to bring it more nearly in line with consumption is in progress, but actual consumption has changed little in the past three months.

Many in the steel trade expect that second quarter consumption will exceed that for the first quarter, as outdoor work increases, but the situation is not so clear as to the future rate of mill operations or the extent to which consumers' stocks have been built up under the heavy shipments of the past five months.

It is well recognized that sentiment has been affected by the developments of the past two weeks in speculative markets, but the controlling factor in iron and steel is still the ability of producers to make new sales at prices somewhat above those at which shipments on old orders are invoiced.

Pig iron output in March is estimated at 3,522,000 tons, or 113,613 tons a day, on the basis of returns to THE IRON AGE from 90 per cent of the capacity active. For the 28 days of February the total was 3,214,143 tons, or 114,791 tons a day. Thus the March rate was about 1200 tons less than that of February, though nearly 5000 tons more than the 108,720 tons a day for January.

March is usually a month of high pig iron production, and last month a good many furnaces were crowded, especially in the Chicago district. As April opens, the number of active furnaces is a few less than that of March 1, and several steel company blast furnaces are scheduled to go out this month.

However, no drastic curtailment, either in blast furnace or steel works operations, is looked for. The Steel Corporation is still operating above a 90 per cent rate, with the average for independent companies somewhat under 80.

The price situation differs in various products. In bars, with mills quite well booked, especially in the Chicago district, the market has been well held. Structural material, on the other hand, is irregular, and rather more so just now than plates. In sheets the decline has been \$2 to \$5 from the asking prices of a few weeks ago. On wire products the \$2 advance announced in February has been definitely abandoned.

Weakness in pig iron is more marked. In the Chicago district, where foundry, malleable and basic grades have been quoted at \$24 for nearly three months, prices have receded \$1, and in the East, including the Buffalo district, the market is about \$1 lower. In Pittsburgh and some other districts the situation is nominally unchanged, but there is not enough business for a real test. Tennessee iron

continues to be sold as low as \$18.50, but Alabama iron is being quoted at \$20 for Southern delivery and even higher.

Over against present sentiment developments in the foundry trade are favorable. Demand for skilled molders on heavy work has increased in the Central West. Ohio foundries melted more iron in February than in January, and January was better than December.

Some of the large automobile builders are now operating at capacity, and April production will show a good gain over the best month of the first quarter.

Lake Superior iron ore prices for the season are likely to be established in the next few days, whether on last season's basis or at a slight reduction is yet uncertain.

On sheet bar deliveries in the second quarter \$37 is now indicated as the basis. Large tonnages are being carried over on first quarter contracts.

Two-thirds of the 20,000 tons of fabricated steel bookings reported in the past week were for business and industrial buildings. Fresh inquiries appeared for 27,000 tons, 75 per cent being for public work, including 17,000 tons for a transportation tunnel at New York.

The possibilities in the import trade are again illustrated in the buying of 6000 tons of Belgian reinforcing bars for use on a large sewer contract in Brooklyn. Deliveries will be 1000 tons a month, though the work extends over 15 months. The price was not far from \$10 below the domestic market.

French cast iron pipe continues to make inroads. At Detroit the French bid on nearly 7000 tons of large diameter pipe was \$1.72 a ton less than the lowest price put in by domestic makers.

Two lots of rails for the Chinese Government are up for bids—20,000 tons of 60-lb. and 16,000 tons of 80 to 90-lb. Americans have had a large share of Chinese rail orders heretofore.

Declines in foundry pig iron caused THE IRON AGE pig iron composite price to fall to \$21.54, from \$21.88 last week, reaching the lowest level since mid-December and \$1 below the corresponding date in 1924.

Pittsburgh

Fair Business in Steel—Preparing to Curtail Ingot Production

PITTSBURGH, March 31.—The past week appears to have been productive of a fair amount of steel business for manufacturers in this and nearby districts, but there is no claim that incoming orders and specifications equal the shipments against old business, and with order books running down an adjustment of production to demand is immediately ahead.

There has been no material change in the rate of production the past week compared with the week before, but plainly there is no longer any tendency in the direction of record outputs and preparations are in progress for a curtailment of ingot production. The Carnegie Steel Co. produced ingots this last week at about the rate of 86 per cent of capacity, but indications at the beginning of this week were for some let

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 31, 1925	Mar. 24, 1925	Mar. 3, 1925	Apr. 1, 1924
No. 2X, Philadelphia...	\$23.26	\$24.26	\$25.01	\$23.26
No. 2, Valley Furnace...	21.00	21.00	21.50	22.50
No. 2, Southern, Cin'ti...	24.05	24.05	24.05	26.55
No. 2, Birmingham, Ala.†	20.00	20.00	20.00	22.50
No. 2 foundry, Chicago*	23.00	24.00	24.00	24.50
Basic, del. eastern Pa...	22.75	23.75	23.75	21.50
Basic, Valley Furnace...	21.00	21.00	21.50	21.75
Valley Bessemer del. P'gh.	23.76	23.76	24.26	24.76
Malleable, Chicago*	23.00	24.00	24.00	24.50
Malleable, Valley	21.50	21.50	21.50	22.50
Gray forge, Pittsburgh...	22.26	22.26	22.76	23.76
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.15
Ferromanganese, furnace...	115.00	115.00	115.00	107.50

Rails, Billets, Etc., Per Gross Ton:	Mar. 31, 1925	Mar. 24, 1925	Mar. 3, 1925	Apr. 1, 1924
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	35.50	37.00	37.00	40.00
O.-h. billets, Pittsburgh...	35.50	37.00	38.00	40.00
O.-h. sheet bars, P'gh.	37.00	38.00	38.00	42.50
Forging billets, base, P'gh.	41.00	42.50	42.50	45.00
O.-h. billets, Phila.	41.67	41.67	41.67	45.17
Wire rods, Pittsburgh...	48.00	48.00	48.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.10	2.10	2.10	2.30
Light rails at mill.	1.80	1.80	1.80	2.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.28	2.28	2.28	2.52
Iron bars, Chicago	2.10	2.10	2.10	2.40
Steel bars, Pittsburgh...	2.10	2.10	2.10	2.30
Steel bars, Chicago	2.20	2.20	2.20	2.40
Steel bars, New York	2.44	2.44	2.44	2.64
Tank plates, Pittsburgh...	2.00	2.00	2.00	2.30
Tank plates, Chicago	2.30	2.30	2.30	2.60
Tank plates, New York	2.34	2.34	2.34	2.54
Beams, Pittsburgh	2.10	2.10	2.10	2.30
Beams, Chicago	2.30	2.30	2.30	2.60
Beams, New York	2.34	2.44	2.44	2.59
Steel hoops, Pittsburgh...	2.40	2.40	2.50	2.90

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Mar. 31, 1925	Mar. 24, 1925	Mar. 3, 1925	Apr. 1, 1924
Sheets, black, No. 28, P'gh.	3.40	3.40	3.50	3.75
Sheets, black, No. 28, Chi-				
cago dist. mill.	3.60	3.70	3.70	...
Sheets, galv., No. 28, P'gh.	4.50	4.60	4.75	4.90
Sheets, galv., No. 28, Chi-				
cago dist. mill.	4.70	4.85	4.85	...
Sheets, blue, 9 & 10, P'gh.	2.65	2.70	2.70	2.90
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.	2.70	2.80	2.80	...
Wire nails, Pittsburgh...	2.85	2.85	2.85	3.00
Wire nails, Chicago dist.				
mill.	2.95	2.95	2.95	...
Plain wire, Pittsburgh...	2.60	2.60	2.60	2.75
Plain wire, Chicago dist.				
mill.	2.70	2.70	2.70	...
Barbed wire, galv., P'gh.	3.55	3.55	3.55	3.80
Barbed wire, galv., Chicago				
dist. mill.	3.65	3.65	3.65	...
Tin plate, 100 lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	Mar. 31, 1925	Mar. 24, 1925	Mar. 3, 1925	Apr. 1, 1924
Carwheels, Chicago	\$16.00	\$16.50	\$18.50	\$17.00
Carwheels, Philadelphia	18.00	18.50	19.00	18.50
Heavy steel scrap, P'gh.	18.00	18.00	18.50	17.50
Heavy steel scrap, Phila.	15.50	16.00	16.00	16.00
Heavy steel scrap, Ch'go.	15.50	16.00	17.25	15.00
No. 1 cast, Pittsburgh	18.00	18.00	19.00	19.00
No. 1 cast, Philadelphia	18.00	18.00	18.00	18.50
No. 1 cast, Ch'go (net ton)	17.50	18.00	18.50	19.00
No. 1 RR. wrot. Phila.	18.50	19.00	19.00	19.00
No. 1 RR. wrot. Ch'go (net)	13.50	14.50	15.50	13.00

Coke, Connellsville, Per Net Ton at Oven:	Mar. 31, 1925	Mar. 24, 1925	Mar. 3, 1925	Apr. 1, 1924
Furnace coke, prompt	\$3.25	\$3.25	\$3.50	\$3.75
Foundry coke, prompt	4.00	4.00	4.25	4.75

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.75	14.37½	14.75	13.75
Electrolytic copper, refinery	13.25	14.00	14.37½	13.37½
Zinc, St. Louis	7.00	7.30	7.30	6.22½
Zinc, New York	7.35	7.65	7.65	6.57½
Lead, St. Louis	8.12½	8.65	8.75	8.70
Lead, New York	8.45	8.90	9.00	9.00
Tin (Straits), New York	52.37½	53.62½	54.87½	50.62½
Antimony (Asiatic), N. Y.	14.00	14.00	16.00	11.75

THE IRON AGE Composite Prices

March 31, 1925, Finished Steel, 2.531c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.	{	March 24, 1925, 2.531c.
		March 3, 1925, 2.546c.
		April 1, 1924, 2.703c.
		10-year pre-war average, 1.689c.

March 31, 1925, Pig Iron, \$21.54 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	{	March 24, 1925, \$21.88
		March 3, 1925, 22.25
		April 1, 1924, 22.59
		10-year pre-war average, 15.72

1923	High 1924	1925	1925	Low 1924	1923
2.824c., April 24	2.789c., Jan. 15	2.560c., Jan. 6	Finished Steel 2.531c., March 17	2.460c., Oct. 14	2.446c., Jan. 2
\$30.86, March 20	\$22.88, Feb. 26	\$22.50, Jan. 13	Pig Iron \$21.54, March 31	\$19.21, Nov. 3	\$20.77, Nov. 20

down and also the putting out of two blast furnaces. The leading local independent also sees the need of lighter production than it has had over the past four months. It is probable that actual production will drop more than will be indicated by the number of idle producing units, because there will not be the need of forcing production there would be if the demand was of a more urgent character.

What is going on in the steel industry at present is regarded here as merely an adjustment made necessary by the fact that producers let plant operations get altogether too high based on real orders and shipments ran too heavy to be assimilated as promptly as could be desired. Predictions as to the duration of the down-

ward swing of plant operations vary considerably. Some take the position that excess of supply over consumption already has been corrected in a large measure, and that an upward swing is not far off. The more common expression, however, is that the end of the down swing is still some distance off and that the course of prices will have much to do with a reaction. So long as market quotations are above invoice prices, as is the case today, buyers would be expected to keep on specifying, but no such course would be likely in the event that the market develops real weakness.

Heavier production schedules of the automotive industry are counted on to provide a good deal of steel business over the next few months, and the word from

the agricultural implement industry is that it is planning for a large 1926 season, which, of course, would bring out a good deal of steel business for shipment over the last half of this year. There are few in the steel industry here who do not subscribe to the idea that consumption will be better in the coming three months than it was in the last three months, and this is expected to cut down excessive stocks wherever they exist. It is not believed that stocks of unfinished steel in manufacturers' hands are as large as they were at this time last year.

The scrap situation still is dull and weak, with prices now \$4 a ton lower on steel works grades than they were at the outset of the year. There is some evidence that steel makers are using a heavier ratio of scrap to pig iron in their mixes, and this means less consumption of pig iron and incidentally strengthens the notion that there is going to be a rather keen competition for any business that may develop in pig iron.

Prices of pig iron are the same as they were a week ago, but they are absolutely nominal and few producers expect to get the prices they are quoting when any business comes up. The weak position of both scrap and pig iron is not a helpful influence on the steel market, nor is the recent wage reduction in the Connellsville district, which has brought about lower costs for coke and coal, helpful to price stabilization.

Pig Iron.—Business in this market is at a standstill with even carload lot sales fewer than they were recently. The explanation is to be found in the fact that producers are waiting on consumers to indicate that they need some iron while consumers not only are well supplied but are going on the theory that by waiting the producers eventually will again start quoting "bargain" prices. The various grades are quoted at last week's prices, but there is a general realization on the part of producers that any demand that develops will be followed by a good deal of pencil sharpening. The Carnegie Steel Co. has put out one of its Carrie furnaces and is figuring on putting out two more late this week or the forepart of next week. The stack of the Clinton Iron & Steel Co., the only merchant furnace in Pittsburgh, will go out soon and the Claire furnace at Sharpsville will probably stop making iron along about the middle of April. W. P. Snyder & Co. make the average price of Bessemer iron from Valley furnaces for March \$22.30, as compared with \$22.738 in February and of basic \$21.30, against \$21.50 in February.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$21.00
Bessemer	22.00
Gray forge	20.50
No. 2 foundry	21.00
No. 3 foundry	20.50
Malleable	21.50
Low phosphorus, copper free.....	29.00

Ferroalloys.—A report has been going the rounds that British makers of ferromanganese were considering a reduction in the price, due to the fact that their order books had become pretty slim and in spite of the high cost of ore they were anxious to build up backlog tonnages. Local agents of British producers are without advices on the subject, however, and still are quoting \$115 c.i.f. Atlantic seaboard, duty paid. Domestic makers are at the same base, furnace, with freight equalized from the seaboard. No business of importance is being done and some agents say that it has been two months since they had any business. Deliveries on contracts are reasonably good. Spiegeleisen is moving well on old orders, but there is no new business worth mentioning. New business in 50 per cent ferrosilicon is light because all of the large users bought for at least the first half of this year late last year and have not found it necessary to supplement contract shipments. Prices are given on page 1009.

Semi-Finished Steel.—Considerable tonnage of billets, slabs and sheet bars bought for first quarter shipment remains unspecified at the close of that period and will be carried into the second quarter for delivery. The price on first quarter sheet bar tonnages was

not more than \$37, Pittsburgh or Youngstown, and on slabs and billets \$1 to \$1.50 a ton less. It is a little surprising in view of the high rate of production of the independent sheet makers that there should be any unspecified first quarter sheet bars tonnage, but it is probably explained by the fact that the smaller producers, all of whom buy their steel, did not do as well in point of sales or production as did the larger units. It is easy to understand, in view of the admitted carry-over, why local and Youngstown reports indicate a lack of interest in the market. Just now the market is quotable at \$37 for sheet bars and \$35.50 for billets and slabs. About six months ago a local mill announced a differential of \$10 per ton on forging quality billets over rolling billets, but it was not followed by other makers and has never been insisted on by the maker announcing it. It is claimed that the existing differential of \$5 a ton is too small, based on costs, but seemingly the demand in recent years has not been sufficiently urgent to enable makers to increase it. The rod market is steady at \$48, Pittsburgh or Cleveland. Skelp at 2.10c. is still untested. Prices are given on page 1009.

Wire Products.—Buyers seem to be specifying with a reasonable degree of steadiness, but shipments with all makers now are running ahead of incoming business and order books are being steadily reduced, since strictly new buying is very light. Manufacturers expect a good deal of material to find its way into consumption in the next few months and that the consequent reduction in stocks in second hands will bring larger demands before summer. The price situation remains irregular and uncertain, possibly more on nails than on other products, and establishment of nails at \$2.95, base, per keg, Pittsburgh or Cleveland, and plain wire at \$2.70, appears remote if reports are to be believed that nails still can be bought at \$2.75. Mills in this district deny that this price now can be done and ascribe the report to buyers who had contracts that did not expire until March 31, and who could specify until that date. Most of the business now on mill books is on a base of \$2.85 for nails and \$2.60 for plain wire and it is an unattractive new order that would be turned down at those prices, since specifications on contracts at those prices are not heavy or pressing. Prices are given on page 1008.

Tubular Goods.—There is a steady demand for pipe and while it does not tax capacity, it is fairly satisfactory to producers from the fact that it runs best in the lap-weld sizes. Jobbers are well supplied with the butt-weld sizes and the movement into consumption being only fairly active they are not obliged to buy as freely as usual in keeping their stocks rounded out. Forward buying is not common, because buyers note that the country's productive capacity is now quite ample and that the railroads are serving with unusual efficiency in deliveries. The fact that pipe prices have held up in the face of declines in other products encourages the idea that higher prices are not immediately ahead, and that discourages buying much in advance of real requirements. Fairly good demand is noted for boiler tubes; prices of seamless tubes appear to be holding better than they did late last year and the fore part of this year. Discounts are given on page 1008.

Sheets.—Users of automobile sheets have been fairly liberal purchasers and in many cases have bought for the entire second quarters. In that direction the market is fairly steady at recent prices. But demand for the other finishes has not gained materially nor has the competition for orders subsided appreciably. On blue annealed sheets 2.70c., base, Pittsburgh, is the top rather than the bottom price and galvanized sheets are quoted down to 4.50c., base, while no large tonnages of black sheets are moving at higher than 3.40c., base. The sheet market appears to be going through a digestive period; production and shipments were so heavy over the past 90 or 120 days that new requirements necessarily are light. Mill operations still average under 70 per cent of capacity. Prices are given on page 1008.

Tin Plate.—Specifications for tonnages for delivery by July 1 still are coming in freely and without urging

and another sign of the fact that makers of packers' cans are expecting a big pack of foodstuffs this year is found in an increasing interest in third quarter tonnages and prices. Weather conditions have favored good crops in California, which this year has had ample rain; conditions of a later date, however, will determine whether other producing areas do well or not.

Cold-Finished Steel Bars.—There has been some increase in specifications with the approach of the end of the first quarter and makers here are assured of reasonably good shipments for the next 30 days, but business, although fairly general as to sources, leaves something to be desired. Buying by the automotive industry for the full second quarter has not been nearly so common in cold-finished bars as in sheets; there is the consolation, however, that the automobile builders are not as well protected as was the case a year ago and betterment in that industry is more probable than a decline. At this time last year conditions were the reverse of those of today. Most tonnage is moving at 2.70c., base, Pittsburgh, although 2.80c. is called the regular market price.

Hot-Rolled Flats.—Competition for business still is sharp on material wider than 6 in., and to hold such trade strip makers have found it necessary to again quote more than one base price. On strips 6 in. and narrower they are holding to 2.40c., base, Pittsburgh, but on wider stock a base of 2.20c. has been necessary to hold or get business that plate or jobbing mill operators can quote against. Hoops are selling well and bands fairly well. Nothing yet has been ventured as to this year's price of cotton ties. It is not believed that the carryover from last year amounted to much, but naming a price will probably be deferred until there is a line on the probable size of the crop and what the foreign makers will quote. Hoops, on which tie prices usually are based, are now \$10 per ton lower than at this time last year, but the revision of extras made a change upward in the cost of tie gage and width of hoops of \$5 per ton. Last year's tie price was \$1.40 per bundle of 45 lb., f.o.b. Southern Atlantic ports. Prices are given on page 1008.

Cold-Rolled Strips.—The market no longer is quotable at higher than 4c., base, Pittsburgh, except on small and unattractive orders; it is observed, however, that this price is not being shaded, probably because not a few makers are finding it difficult to do better than get back a new dollar for an old one at that base.

Steel and Iron Bars.—Specifications against contracts for steel bars have been fairly good in the past week, but new demand still is moderate and even on very small tonnages buyers no longer have to pay more than 2.10c., base Pittsburgh. There is some interest in the second quarter contract price of steel bars, but no formal announcement yet has been made on prices.

Structural Material.—Mill operations are sustained largely by specifications on old and low-priced orders. Not much new business is developing, although the mills are now down to 2.10c., base Pittsburgh, even on small tonnages. Structural inquiries are reported to be fairly good, but only a few jobs of size are being let. Plain material prices are given on page 1008.

Plates.—New business is light and the mills are eating in very rapidly on their backlog orders. On small lots the mills still are quoting 2.10c., base Pittsburgh, but it does not take as large a tonnage as recently to bring out a quotation of 2c. Prices are given on page 1008.

Rails and Track Supplies.—There is a good movement of large spikes and other rail accessories on old orders, but new business is quiet. Demand for small spikes has rarely been smaller than it is at present, this being due to the depression in the soft coal industry which, incidentally, explains the continued slack demand for light rails. A report that the Pennsylvania Railroad is in the market for 10,000 tons of tie plates has been denied by that railroad, according to local makers who inquired. Prices are given on page 1008.

Bolts, Nuts and Rivets.—Orders for these products seem to be a little more numerous than was the case recently, but they run small in size and usually call for

early delivery, with the result that few manufacturers have had a considerable amount of business ahead.

Coke and Coal.—Any troubles that attended the recent wage reduction in the Connellsville district appear to have been ironed out and as those operators who did not take this step two weeks ago are planning to do so tomorrow, the district with the exception of the H. C. Frick Coke Co., will be back this week on the November, 1917, scale of wages. Production, after a brief let down, again is increasing and there is plenty of furnace grade at \$3.25 per net ton at ovens for either spot or second quarter shipment and of foundry coke at from \$4 to \$4.75. The supply of slack coal is rather scant and this, rather than a really active demand, accounts for a further stiffening in prices. Otherwise, the coal market is very dull and very depressed. The coal situation attracts unusual interest at the moment on account of the possibility of a dispute over the three year wage scale effected in Jacksonville, Fla., early last year between United Mine Workers of America and operators in the so-called central competitive field. The latter have suffered heavily the competition of the non-union fields and a large number of union mines in western Pennsylvania and southern Ohio, having completed their contracts, will suspend indefinitely today. This is because the operators feel that they cannot pay the union scale and compete profitably with the non-union districts. In the Fairmont, W. Va., district, which formerly was largely a union district, but where non-union conditions have ruled in the past year, the United Mine Workers have called a strike April 1 in an effort to get that district back to its former union status. This district is not far from the lower end of the Connellsville district and there are some fears that if the union demonstration is an impressive one, the trouble may extend across the Pennsylvania boundary.

Old Material.—Prices still tend down in this market and unless there is some increase soon in the consumptive demand it would appear that a drop to levels where dealers could buy for their yards was a possibility. Only a few of the local mills and foundries are buying and then they take on only small lots. Dealers are not buying much, because their short contracts are neither large nor must they be filled immediately; prices are too high for yard purchasers and consumers' bids are so low that they cannot easily buy material and make a profit on the turnover. A consumptive demand would probably send prices sharply higher; lack of it will probably mean a further decline since there is no dealer support. The market on heavy melting steel still is quotable at \$18 to \$18.50, the latter figure representing what would have to be paid for material of good grade, with \$18 the prevailing figure on the bulk of current offerings. Compressed sheets and bundled sheets range \$1.25 and \$2.25 per ton under heavy steel scrap. Some users of turnings lately have been offering \$13, but based on sales the market is quotable at \$13.50 to \$14. The Pennsylvania Railroad is taking bids this week on more than 51,000 net tons of scrap, the list including 5000 tons of heavy melting steel and 12,000 tons of old rails.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	\$18.00 to \$18.50
No. 1 cast, cupola size	18.00 to 18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	18.50 to 19.00
Compressed sheet steel	16.75 to 17.25
Bundled sheets, sides and ends ..	15.75 to 16.25
Railroad knuckles and couplers ..	20.00 to 20.50
Railroad coil and leaf springs ..	20.00 to 20.50
Low phosphorus blooms and billet ends	22.50 to 23.00
Low phosphorus plate and other material	20.50 to 21.00
Railroad malleable	18.00 to 18.50
Steel car axles	21.00 to 21.50
Cast iron wheels	18.00 to 18.50
Rolled steel wheels	20.00 to 20.50
Machine shop turnings	13.50 to 14.00
Short shoveling turnings	13.50 to 14.00
Sheet bar crops	20.00 to 20.50
Heavy steel axle turnings	17.50 to 18.00
Short mixed borings and turnings ..	13.50 to 14.00
Heavy breakable cast	15.00 to 15.50
Stove plate	14.50 to 15.00
Cast iron borings	13.50 to 14.00
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	18.00 to 18.50

Chicago

Pig Iron Quotations Decline \$1—General Price Tendency Downward

CHICAGO, March 31.—As the second quarter opens, the volume of new business shows further recessions, prices are weak or are declining and the situation generally is taking on the characteristics of a buyers' market.

Local pig iron, which has remained unchanged at \$24, base furnace, since early in January, has dropped \$1 a ton. Sheets have declined \$2 to \$5 a ton below the asking price of a few weeks ago, blue annealed being generally quoted at 2.70c., base Chicago district mill, black at 3.60c. and galvanized at 4.70c. In fact, on black and galvanized as low as 3.50c. and 4.60c. are reported in extreme instances. On wire and wire products the \$2 advance announced in February has been definitely abandoned. Local prices on plates, shapes and bars are unchanged, but are expected to give way in view of the increasing pressure for business by Ohio and Pennsylvania mills. Production in these heavier finished products, however, is still practically at capacity. March shipments of a leading local mill will undoubtedly prove to be the largest for any month in history. Through the blowing in of a new blast furnace at the Indiana Harbor plant of the Youngstown Sheet & Tube Co., the number of active steel works stacks has been increased to 33 out of a total of 35 in this district. The other Youngstown stack at Indiana Harbor, however, is scheduled to go out for relining as soon as the new furnace is well established on a production basis. The banking or blowing out of other units would not be an unexpected development in view of their heavy rate of output since the first of the year. The Gary stacks, which formerly averaged 520 tons a day, are now making 620 tons, and the South Works furnaces are averaging 650 tons or better, as against a former rate of 570 tons.

In the cast iron pipe market the spectre of foreign competition has again made its appearance at Detroit, where French pipe was quoted at \$1.72 a ton less than the nearest domestic bid on more than one-half of 12,865 tons advertised by that city.

Pig Iron.—A purchase of 3000 tons of foundry by a Wisconsin smelter brought out a price of \$23, base Chicago furnace, with an addition of only 50c. for one-half a per cent increase in silicon content. This is a decline of \$1 a ton in the base price and of 50c. in the silicon differential which, heretofore, has been \$1. Scattered sales of small lots continue to be made at \$24 base with \$1 up for each one-half per cent addition of silicon, but it is evident that those quotations are passe on tonnage business. The pressure for business by outside producing centers is having its effect in this market. The furnaces of a large motor car builder at Detroit have large excess stocks and part of this tonnage is now being offered here on a competitive basis with the local product. In Michigan and Indiana, Detroit and Toledo competition is increasingly severe and at Muskegon 300 tons of foundry was sold on the basis of \$21, Chicago furnace. Chicago district blast furnaces still have considerable forward business and are not yet burdened with stocks; in fact, one producing interest is still behind on its orders. There is no prospect, therefore, for the early blowing out or banking of merchant stacks. A Michigan automobile builder has closed for 400 tons of 14 to 16 per cent electric ferrosilicon at a reported price of \$44.50 delivered. A central Ohio plant bought 150 tons of 14 to 16 per cent at a reported price of \$42.50. Silvery has declined \$1 a ton. Recent sales of silvery include 400 tons of 10 per cent, 100 tons of 6 per cent and 100 tons of 5 per cent. Tennessee iron has declined to \$18.50, base Birmingham, a small sale in this district having been negotiated at that figure. Alabama furnaces are re-

ported to be holding to a minimum of \$20, although no sales are reported. Foundry melt in this district is below expectations, although exception must be made for those plants serving the automobile and tractor industries whose operations are improving.

Quotations on Northern foundry, high phosphorus, malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$23.00 to \$24.00
Northern No. 1 foundry, sil. 2.25 to 2.75	23.50 to 25.00
Malleable, not over 2.25 sil.	23.00 to 24.00
Basic	23.00 to 24.00
High phosphorus	24.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	25.68
Southern No. 2, sil. 1.75 to 2.25	24.51 to 26.01
Low phos., sil. 1 to 2 per cent, copper free	33.29 to 33.79
Silvery, sil. 8 per cent.	34.29
Electric ferrosilicon, 14 to 16 per cent	45.00

Ferroalloys.—We note a carlot sale of ferromanganese at \$115 seaboard.

We quote 80 per cent ferromanganese, \$122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$40.58, delivered.

Plates.—Railroad equipment buying continues to lag, and local sales of steel to car builders during the week do not exceed 1500 tons. No new oil storage tank awards are reported, but the Standard Oil Co. of Indiana will use its own forces to construct 32 stills, 1150 tons, at Whiting, Ind. Bids are in on riveted pipe lines at Kansas City and Minneapolis, requiring 3200 tons and 1500 tons, respectively. Intermittent plate mill operations are still the rule, and in view of the paucity of new business the price of 2.30c., Chicago, on tank plates is not expected to hold much longer.

The mill quotation is 2.30c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Structural Material.—Lettings for the week were few and although there is a large amount of prospective work, it is slow in reaching the bidding stage. Prominent among active new projects are a hotel at Oklahoma City, 1000 tons, and a local theater for Lubliner & Trinz, 1050 tons. Mills are receiving liberal specifications for plain material, but new business is in diminishing volume. Local prices are unchanged, but weak at 2.30c., Chicago.

The mill quotation on plain material is 2.30c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bars.—Mills have much heavier bookings in soft steel bars than in any other form of finished material, but even in bars new business is falling off. Buyers are in no hurry to get under cover and in many instances believe that they will be able to place orders later at lower quotations. Demand for bar iron is also diminishing, with prices unchanged.

Mill prices are: Mild steel bars, 2.20c.; common bar iron, 2.10c., Chicago; rail steel, 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.70c.

Wire Products.—Prices generally have declined to where they were before the \$2 a ton advance of February. Bright plain wire is now quoted at \$2.70, Chicago district mill, and nails at \$2.95, with some producers offering as low as \$2.90. Cement coated nails remain exceedingly weak, with \$2.25, Chicago district mill, the maximum going price. The competitive pressure of Eastern mills is increasingly keen. The Pittsburgh Steel Co. has established a warehouse at Decatur, Ill. Specifications are not up to expectations and buying by the farmers has been particularly disappointing. The plowing season is close at hand and the time for building and fencing work is largely past. Jobbers serving agricultural communities complain that they cannot dispose of their stocks of nails. Somewhat better specifications have been received from manufacturing users, particularly from automobile and auto-

mobile accessory makers. Wire mill operations range from 70 to 75 per cent. For mill prices see page 1008.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.15 for 100 lb.; common wire nails, \$3.25 per keg; cement coated nails, \$2.55.

Sheets.—Although specifications have been slow in coming in, they have actually proved larger than had been expected. In fact, a local producer is still operating its 28 hot mills. Inquiry is somewhat heavier, although new business is relatively light. Prices are soft and current quotations are as follows: 4.70c. to 4.85c., base, f.o.b. Chicago district mill, on galvanized; 2.70c. to 2.80c. on blue annealed, and 3.60c. to 3.70c. on black.

Chicago delivered prices from mill are 3.75c. for No. 28 black, 2.75c. to 2.85c. for No. 10 blue annealed, 4.80c. to 4.90c. for 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Rails and Track Supplies.—The Chesapeake & Ohio is inquiring for 6000 tons of angle bars, spikes and bolts. The New York Central, instead of the Pennsylvania, as reported last week, is in the market for 10,000 tons of tie plates. It is doubtful whether the present price of tie plates would stand a real test.

Standard Bessemer and Open-hearth rails, \$43; light rails, rolled from billets, 1.90c. to 2c., f.o.b. makers' mill.

Standard railroad spikes, 3c. mill; track bolts with square nuts, 4c. mill; steel tie plates, 2.45c., f.o.b. mill; angle bars, 2.75c. f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts, 4.45c. base.

Bolts and Nuts.—Specifications are in good volume as the first quarter closes, and contracting for second quarter is proceeding at a fair rate. Buyers, however, are showing no anxiety to cover their forward needs. Current orders are scattered and small, and current quotations, lacking a real test, appear to be holding fairly well. For mill prices see page 1009.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to $\frac{3}{4}$ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{3}{4}$ x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squares, tapped or blank, \$3.50 off; hot pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

Cast Iron Pipe.—Revised figures taken by Detroit on 12,865 tons of 12 to 42-in. were even lower than the first bids taken. French pipe was low on 6340 tons of 30 in. and 425 tons of 42 in., with a quotation of \$44.23, delivered Detroit, or the equivalent of \$36.31, base, Birmingham. This price was \$1.72 a ton below the next lowest bid on those sizes. The lowest bids on the other sizes were as follows, although in some instances these tenders did not cover all of the tonnage advertised: 24-in. pipe, \$45 delivered, or \$37.08, Birmingham, submitted by Standard Pipe Co.; 16-in., \$45.55 delivered, or the equivalent of \$37.63, base, Birmingham, submitted by James B. Clow & Sons. The United States Cast Iron Pipe & Foundry Co. filed the lowest bid on the 12-in., \$45.95 delivered, or \$38.03, base, Birmingham, but this figure was submitted on all sizes on the condition that it would hold good only if the company were given the contract for the entire tonnage. The Detroit Water Board has recommended that the pipe be awarded to the low bidders, which would mean that more than half of the tonnage would be supplied from France. Action by the city council has not yet been taken. The National Cast Iron Pipe Co. has been awarded 100 tons for Muskegon, Mich., and is low bidder on 570 tons for Chicago. Henry Rees, Quincy, Ill., has the general contract for 400 tons for Waukegan, Ill.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$51.20 to \$52.20; 6-in. and over, \$47.20 to \$48.20; Class A and gas pipe, \$4 extra.

Warehouse Prices.—Warehouses have put into effect new extras on hoops and bands announced by local mills under date of March 2. The extra of 30c. over the sheared plate price for 3/16-in. universal mill plates has been abandoned.

Reinforcing Bars.—Lettings are in good volume, although new work is not developing as rapidly as had

been expected. While competition is somewhat keener, prices on billet reinforcing bars are still fairly steady at 2.70c., Chicago warehouse. Lettings of steel for road work are likely to be heavier during the coming weeks. Two contracts placed during the past few days call for 300 tons.

Lettings include:

Rock Island Lines, elevator, Council Bluffs, Iowa, 400 tons of rail steel to LaCledde Steel Co.

Illinois highway work, 200 tons, Henkel Construction Co., Mason City, Iowa, general contractor, to Kalman-Steel Co.

Great Northern Railway, St. Paul, 200 tons for delivery at Duluth, to Jones & Laughlin Steel Corporation.

Ure Building Corporation, theater, commercial and apartment building, 1749 Howard Street, Chicago, 153 tons to Concrete Steel Co.

Theater, Fond du Lac, Wis., 100 tons to American System of Reinforcing.

Congdon Boulevard paving, Duluth, Minn., 100 tons to Concrete Steel Co.

Apartment building, 440 Belmont Avenue, Chicago, 100 tons of rail steel to Inland Steel Co.

Mount Sinai Hospital, Chicago, 300 tons to Olney J. Dean & Co.

Pending work includes:

Hospital and laboratory, University of Chicago, Chicago, 700 tons.

Municipal work, Minneapolis, Minn., 100 tons, C. A. P. Turner & Co., low bidder.

Western News Co. building, Chicago, 150 tons, general contract awarded to Turner Construction Co.

Shriners' Hospital, Chicago, 105 tons.

Morton high school, Cicero, Ill., 100 tons.

Coke.—St. Louis district by-product foundry coke has been laid down here at \$10 delivered, as compared with the ruling price on the local product of \$10.75 delivered.

Old Material.—Prices continue to decline in the absence of sustained consumer buying. The last mill purchase of heavy melting, a small one, was at \$16 delivered. A fair tonnage of frogs, switches and guards cut apart brought \$16.50 delivered. Railroad offerings are heavy, including the Pennsylvania, 50,000 tons; the Burlington, 7500 tons; the New York Central, 9000 tons; the Chicago & Northwestern, 5400 tons; the Santa Fe, 2400 tons; the St. Paul and the Nashville, Chattanooga & St. Louis, 600 tons each; the Michigan Central and the Erie, blank lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	\$17.50 to \$18.00
Cast iron car wheels	16.00 to 16.50
Relaying rails, 56 and 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	18.00 to 18.50
Railroad tires, charging box size	18.50 to 19.00
Railroad leaf springs, cut apart	18.00 to 18.50
Rails for rolling	17.00 to 17.50
Steel rails, less than 3 ft.	18.00 to 18.50
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	16.00 to 16.50
Shoveling steel	15.25 to 15.75
Drop forge flashings	11.50 to 12.00
Hydraulic compressed sheets	13.50 to 14.00
Axle turnings	14.00 to 14.50
Steel angle bars	17.00 to 17.50
Steel knuckles and couplers	18.00 to 18.50
Coil springs	19.00 to 19.50
Low phos. punchings	17.50 to 18.00
Machine shop turnings	10.50 to 11.00
Cast borings	13.00 to 13.50
Short shoveling turnings	13.00 to 13.50
Railroad malleable	18.50 to 19.00
Agricultural malleable	17.00 to 17.50

Per Net Ton

Iron angle and splice bars	17.50 to 18.00
Iron arch bars and transoms	19.00 to 19.50
Iron car axles	26.00 to 26.50
Steel car axles	16.50 to 17.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	9.00 to 9.50
Pipes and flues	10.00 to 10.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.75 to 14.25
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	16.00 to 16.50
No. 1 agricultural cast	16.00 to 16.50
Locomotive tires, smooth	16.50 to 17.00
Stove plate	13.50 to 14.00
Grate bars	13.50 to 14.00
Brake shoes	13.50 to 14.00

New York

Specifications Slow on Steel Contracts Above Prevailing Market—Blue Sheets Lower

NEW YORK, March 31.—The pig iron market is weak and with so little business being transacted that it is difficult to quote with accuracy, but the range in eastern Pennsylvania now seems to be \$22 to \$22.50 for No. 2 plain and in Buffalo, \$21 to \$21.50, but it is intimated that even lower prices could be made on desirable business. So much iron sold for delivery in the first quarter remains to be delivered that very little new business is expected for the second quarter and few sales have been made for third quarter except those announced several weeks ago. A sale of 225 tons for third quarter has been made to a New Jersey melter. This is the only transaction for that delivery reported in the New York district. The New York Central is in the market for 1200 tons for second quarter. Foreign iron prices are being adjusted by some sellers to meet the domestic price situation. Despite the extreme quiet in the market, foundries seem to be fairly busy and sellers entertain the hopes that there will soon be a buying movement of fair proportions for third quarter.

Assistant Secretary of the Treasury Moss has expressed the opinion that "the industry of manufacturing pig iron in the United States is being or is likely to be injured by reason of the importation into the United States of pig iron from the Province of Ontario, Canada, and that such merchandise is sold, or is likely to be sold, in the United States at less than its fair value." No official opinion has been expressed as to Indian iron.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25..	\$24.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	25.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	25.02
Buffalo, sil. 1.75 to 2.25.....	\$25.91 to 26.41
No. 2 Virginia, sil. 1.75 to 2.25..	29.44

Ferroalloys.—Consumers of ferromanganese and spiegeleisen are not holding up shipments on contracts, but the placing of new business has practically stopped. Quotations are firm at those levels, which have prevailed for some time. New business in 50 per cent ferrosilicon and in standard ferrochromium is exceedingly light.

Cast Iron Pipe.—Opening of bids on 12,000 tons of bell and spigot pipe by Oneida, N. Y., March 27, is understood to have again resulted in a low bid from the Pont-a-Mousson works. This is the second time this company has been low bidder on this tonnage, the first set of bids having been rejected. Prices are now being obtained from contractors on laying the pipe. Purchasing by small users continues in good volume. The soil pipe market is still unsteady with the larger orders bringing out discounts of 2½ points higher than prevailed previous to the present scale.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$52.60 to \$53.60; 4-in. and 5-in., \$57.60 to \$58.60; 3-in., \$67.60 to \$68.60, with \$5 additional for Class A and gas pipe. Discounts on both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 40 to 41½ per cent off list; heavy, 50 to 51½ per cent off list.

Warehouse Business.—With most houses the volume of business is termed fair. Yet the leading independent found March business the best for many months, and still at that rate. It is recalled, however, that the rigors of weather checked the normal flow of winter orders. Sheet prices seem to have settled at the reduced levels made a week ago. Cutting in other lines persists. Brass sheets, rods, etc., have declined further. Activity was best in structural steel, and in reinforcing bars which are quoted at 3.15c. Other prices are on page 1034. We quote boiler tubes per 100 ft. as follows:

Lapwelded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Finished Iron and Steel.—At the beginning of the

second quarter constructive developments are still lacking in the local steel market. While all mills, with the exception of some of the Eastern plate mills, are running at a fair rate and have a reasonable volume of business ahead, the new buying is of small proportions. March closed with fairly good specifications on first quarter contracts and the material which many consumers will receive on these contracts will carry them well along in second quarter and there will be little occasion for further coverage for the next month or two months. Excepting on steel bars, which hold firm at 2.10c., Pittsburgh basis, the price situation is weak. The plate mills have done well in holding the price at 2c., Pittsburgh, in view of the small amount of plate business available. There has been greater weakness in structural shapes notwithstanding larger business than in plates. Shapes have sold below 2c. in some instances and nothing above 2c. is obtainable except on very small lots. Following other forms of sheets, weakness has extended to blue annealed, which has been sold at a basis of 2.60c., Pittsburgh. Somewhat to the surprise of the New York steel trade, the contractor who is to build the Brooklyn sewer, a city contract, will procure the reinforcing bars, amounting to 6000 tons, from a Belgian mill, deliveries to be accepted at a rate of approximately 1000 tons a month. The price is understood to be \$10 or \$12 a ton less than bars from American mills could have been bought for. The City of New York has inquired for 17,000 tons of steel for the Narrows Tunnel to be built from Staten Island to Brooklyn, bids closing May 8. The award will probably be made this week of 17,000 tons for the power house to be built by the New York Edison Co. An inquiry has appeared covering 7700 tons of lapweld pipe. Railroad car orders and inquiries are small, the only important work of the week being an order for the repair of 2000 cars for the Missouri Pacific.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.44c.; plates, 2.34c.; structural shapes, 2.34c.

Coke.—Operations are on a reduced basis and the situation is complicated by weakness in pig iron, by curtailed activity among furnaces, and by the double wage rate in the Connellsville area. Competition is felt from by-product plants of steel companies, which have reduced pig iron output. Two by-product interests in New England are quoting \$11.50 for nearby specification within that area. For beehive furnace grade, \$3.25 is the prevailing price; on foundry coke, \$4 to \$4.50. By-product coke is still selling at \$10.41, Newark and Jersey City.

Old Material.—Brokers buying prices on heavy melting steel have declined again, the offering price for delivery to Bethlehem being \$14.50 per ton for railroad grade. The recent purchase by a Bethlehem consumer of 20,000 tons of heavy melting steel was filled quickly by the brokers, who report no particular shortage of steel in evidence. Buying prices in eastern Pennsylvania are quotable at \$14.50 to \$15 per ton, the latter quotation based on occasional purchases for shipment to Conshohocken. A Phoenixville, Pa., consumer is still receiving shipments of machine shop turnings bought by brokers at \$12.50 per ton delivered.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....	\$10.50 to \$11.00
Heavy melting steel, railroad or equivalent	11.50 to 12.00
Rails for rolling.....	14.50 to 15.00
Relaying rails, nominal.....	24.00 to 25.00
Steel car axles.....	18.50 to 19.00
Iron car axles.....	24.00 to 24.50
No. 1 railroad wrought.....	14.50 to 15.00
Forge fire	10.00 to 10.50
No. 1 yard wrought, long.....	13.50 to 14.00
Cast borings (steel mill).....	9.50 to 10.00
Cast borings (chemical).....	15.00 to 16.00
Machine shop turnings.....	9.00 to 9.50
Mixed borings and turnings.....	9.00 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	11.25 to 11.75
Stove plate	10.00 to 11.00
Locomotive grate bars.....	12.00 to 12.50
Malleable cast (railroad).....	15.00 to 15.50
Cast iron car wheels.....	14.00 to 14.50
No. 1 heavy breakable cast.....	12.00 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$16.00 to \$18.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

Boston

Buffalo Iron Is Sold at a Concession—Foreign Iron Unsettled

BOSTON, March 31.—Interest the past week centered in a 2000-ton inquiry for No. 1X iron for second quarter delivery. Business otherwise was confined to a very few scattering cars of more or less special lots for which full prices were generally paid. The 2000-ton lot was reported to have been taken by a Buffalo furnace at \$21.50 furnace or \$26.41 delivered. Allowing for 50c. differentials, this lot figures out at \$20 furnace base, or \$1.50 under the previously lowest price submitted by a Buffalo furnace. Foreign iron holders quoted even lower prices on this business, but the buyer was interested in domestic iron only. Foreign iron holders in some instances are asking foundries to make a bid on iron. Buyers naturally are holding off, consequently it is difficult to establish the real status of prices. An additional 3657 tons of Indian iron has been received at this port, making an aggregate of 16,567 tons of such iron to be landed here so far this year. A Massachusetts machinery manufacturer is in the market for 600 tons of No. 2X iron for second quarter delivery. No other inquiries for round tonnages are reported.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$26.65 to \$27.15
East. Penn., sil. 2.25 to 2.75.....	26.65 to 27.65
Buffalo, sil. 1.75 to 2.25.....	26.41 to 26.91
Buffalo, sil. 2.25 to 2.75.....	26.91 to 27.41
Virginia, sil. 1.75 to 2.25.....	29.92
Virginia, sil. 2.25 to 2.75.....	30.42
Alabama, sil. 1.75 to 2.25.....	31.60
Alabama, sil. 2.25 to 2.75.....	32.10

Cast Iron Pipe.—Malden, Mass., is readvertising for bids on 175 tons 4-in. to 12-in. pipe. The previous low bid was on French pipe, but was not accepted. Everett, Mass., has closed bids on 100 tons 16-in. pipe and a car of 6-in. Here again the low bid was on French pipe, but no award has been made. Domestic pipe makers are still making concessions on large sizes, but the market for small pipe appears firm. Prices as quoted openly follow: 4-in., \$62.10 a ton delivered common Boston rate points; 6-in. to 12-in., \$57.10; 16-in. and larger, \$56.10. The usual differentials of \$5 on Class A and gas pipe are quoted.

Shapes and Plates.—The past week has witnessed a slowing down in fabricated steel prospects, due to the possibility of labor troubles. Up to April 1 the agreement with some of the building trades had not been signed by employers inasmuch as trade unions are demanding higher wages. All bids on 600 tons of steel required for a high school, New Bedford, Mass., were rejected. The market on shapes appears firmer in that mills are no longer protecting fabricators on a 1.90c. f.o.b. cars base. It is doubtful whether less than 2c. can be done on the most attractive tonnages, and the bulk of current sales are on a basis of 2.10c. to 2.20c. mill. The market on plates appears to be 2c. to 2.10c. on cars mills.

Coke.—The Providence Gas Co., followed by the New England Coal & Coke Co., has made the price of by-product foundry coke \$11.50 a ton delivered within New England to apply of April specifications against first half contracts. That price represents a drop of 50c. a ton. April specifications to date have been small, but it is believed that when the reduction becomes generally known they will increase. March shipments from local ovens to foundries were well below those for the corresponding month last year.

Old Material.—If possible, the old material market is less active. Most of those large shippers heretofore making deliveries on old contracts have cleaned up, and current activity is confined to a few scattering car lots of miscellaneous material, mostly mixed borings and turnings and machine shop turnings. Prices are heavy in the absence of buying. Heavy melting steel, pipe, chemical borings and mixed borings and turnings have depreciated about 50c. a ton in value, while rail-

road wrought and yard wrought are down 25c. Machinery cast is about 50c. a ton lower. Railroad malleable is in demand, scarce and the strongest material in the market. The scarcity of railroad scrap is attested by the current offering by the Boston & Albany Railroad, which consists of but five lots, the largest being 500 tons of steel.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$19.00 to \$19.50
No. 2 machinery cast.....	17.00 to 17.50
Stove plates.....	13.50 to 14.00
Railroad malleable.....	20.00 to 21.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$11.00 to \$12.00
No. 1 railroad wrought.....	13.75 to 14.00
No. 1 yard wrought.....	12.75 to 13.50
Wrought pipe (1-in. in diam., over 2 ft. long).....	10.50 to 11.00
Machine shop turnings.....	8.00 to 8.50
Cast iron borings, chemical.....	13.00 to 13.50
Cast iron borings, rolling mill.....	8.50 to 9.00
Blast furnace borings and turnings.....	7.75 to 8.00
Forge scrap.....	9.50 to 10.00
Bundled skeleton.....	8.50 to 10.00
Bundled cotton ties.....	8.50 to 9.50
Forged flashings.....	9.50 to 10.00
Shafting.....	17.50 to 18.00
Street car axles.....	17.50 to 18.00
Rails for rerolling.....	11.50 to 13.50
Scrap rails.....	11.00 to 12.00

Birmingham

Persistent Reports of Price Shading on Pig Iron—Sales Disappointing

BIRMINGHAM, ALA., March 30.—Consumers and furnace interests alike have continued the waiting game. Sales of pig iron have been slow, with the total tonnage sold for delivery during the second quarter of the year not near expectations. The \$22 per ton base for No. 2 foundry iron has been generally maintained, but reports will not down that in addition to Tennessee furnace companies selling under \$19 per ton, Birmingham base, some iron has been sold in this immediate territory at less than \$20. The La Follette stack is out of blast, the company has no unsold iron on yard and is not quoting for any delivery. Practically all of the sales being made are for the city trade in Birmingham. The active consumers appear to be in position to hold off for a while in their buying. No mention is made of curtailment in production, 16 blast furnaces being on foundry iron.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil....	\$21.50 to \$22.00
No. 1 foundry, 2.25 to 2.75 sil....	22.00 to 22.50
Basic.....	21.00 to 22.00
Charcoal, warm blast.....	20.00

Steel.—Slight improvement in the steel market here is noted. Steel fabricating plants are working steady forces and shipments on small jobs are providing good aggregates. The Connors Steel Co. mill here is going well on hoops, bands and cotton ties. The Tennessee Coal, Iron & Railroad Co. plants have considerable business to fill, American Steel & Wire Co. and Gulf States Steel Co. are producing wire and nails besides other steel products. The latter company has four out of six open-hearth furnaces in operation. Soft steel bars, Birmingham, are quoted at 2.25c. to 2.35c.

Coke.—Eleven hundred and eighty by-product coke ovens are producing coke, practically all for company use, 230 beehive ovens are producing coke for commercial use, 300 beehive ovens are on company coke and 100 beehive ovens on pitch coke. The by-product coke is selling around \$5 per ton with a little of the beehive foundry coke bringing \$5.50. Consumption of coke is improving and independent companies continue getting in contracts. Rebuilding of 40 by-product ovens of the Woodward Iron Co. will be finished in July. The new by-product coke plant of the Republic Iron & Steel Co. with 57 ovens will be completed by Nov. 1.

Old Material.—New business in scrap iron and steel is light and consumers are asking for hold-up on delivery on old contracts. Quotations are weak but unchanged in the past two weeks. Heavy melting steel

at \$14 includes delivery charges in the immediate district.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	14.00 to 15.00
Railroad wrought.....	13.00 to 14.00
Steel axles.....	18.00 to 19.00
Iron axles.....	19.00 to 20.00
Steel rails.....	14.00 to 15.00
No. 1 cast.....	17.00 to 17.50
Tramcar wheels.....	17.00 to 17.50
Car wheels.....	16.00 to 17.00
Stove plate.....	14.50 to 15.50
Machine shop turnings.....	8.00 to 9.00
Cast iron borings.....	8.00 to 9.00
Rails for rolling.....	16.50 to 17.00

Cincinnati

Pig Iron Prices Soft, but Sales Have Increased —Coke and Scrap Weak

CINCINNATI, March 31.—Sales of pig iron increased slightly during the past week, but prices are soft and dealers are shading quotations in order to secure business. Shipments on contracts are holding up well. The furnace of the Belfont Iron Works, Ironton, Ohio, which was banked several weeks ago, will resume operations within a few days. Consumers are buying mostly for immediate needs and due to the downward trend of prices are feeling their way in preference to purchasing large quantities of pig iron. Sales of Northern iron were more numerous than a week ago. A central Ohio consumer bought 500 tons of Northern basic for April shipment. A local dealer sold 200 tons of Northern to a southern Indiana concern. The National Foundry & Furnace Repair Co., Dayton, Ohio, bought 100 tons of Northern foundry for immediate shipment. A carload of Northern foundry went to a central Ohio foundry at \$21 Ironton. This was for immediate delivery. Several carloads of Northern silvery have been sold to southern Indiana consumers. Inquiries for Northern iron are more numerous. A Michigan consumer is inquiring for 650 tons of Northern silvery for April and May delivery. The Fulton Foundry, St. Louis, is in the market for 500 tons of Northern foundry. The New York Central Railroad has an inquiry out for 1250 tons of Northern foundry and 100 tons of Northern silvery for shipment to Elkhart, Ind., and to Frankfort, N. Y. The Buick Motor Car Co., Flint, Mich., has purchased 250 tons of 14 to 16 per cent ferrosilicon. The American Car & Foundry Co., St. Louis, has bought a carload of 12 to 13 per cent ferrosilicon. A northern Ohio consumer is in the market for a carload of 14 to 16 per cent ferrosilicon. Sales of Southern iron have been limited to Tennessee furnaces. It is reported that the Estate Stove Co., Hamilton, Ohio, bought about 300 tons of Tennessee iron at \$19 Birmingham. A local dealer sold 150 tons of Tennessee iron for immediate shipment at \$19. The Louisville & Nashville Railroad has purchased about 425 tons of Southern iron. Inquiries for Southern iron are light. The price of Northern iron ranges from \$21 Ironton to \$22.25. Two furnaces are asking \$22.50 Ironton, but are selling at lower figures. Tennessee iron is selling at \$19 Birmingham, but it is thought that a sizable tonnage would develop a price of \$18.50. Alabama furnaces are asking \$21 Birmingham to \$22, but are not securing any business at these quotations.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base).....	\$24.05 to \$25.05
Alabama fdy., sil. 2.25 to 2.75.....	24.55 to 25.55
Tennessee fdy., sil. 1.75 to 2.25.....	22.55 to 23.05
Southern Ohio silvery, 8 per cent	32.77
Southern Ohio fdy., sil. 1.75 to 2.25.....	23.27 to 24.52
Southern Ohio, basic (nominal).....	24.27
Southern Ohio malleable.....	24.27 to 25.27

Fluorspar.—Two cars of 85 and 5 per cent fluorspar were sold during the past week at \$19. One of these went to the Kokomo Steel & Wire Co., Kokomo, Ind.

Reinforcing Bars.—No sizeable projects were awarded during the past week. However, a considerable number of important jobs are now pending. These include the Phelps Apartments, Cincinnati, 600 tons;

hotel on Garfield Place, 100 tons; Children's Hospital, 300 tons; the J. Charles McCullough Seed Co., 500 tons; the Norwood School, 80 tons. Sellers are pleased with the outlook for business during the next month. There has been no change in the quotation of 2.10c., mill, which seems well established.

Structural Steel.—A temporary dullness has settled upon the local market. The G. A. Gray Co. awarded approximately 500 tons to the Austin Co. Inquiries are poor, but dealers feel that there will be an improvement shortly. Several small jobs have been let to fabricators during the past week. The Board of Education, Cincinnati, has taken bids on about 200 tons for the College Hill School. The price of 2.10c., Pittsburgh, is the prevailing quotation.

Plates, Shapes and Bars.—Buyers continue to adhere to a cautious policy and apparently are content to purchase only enough tonnage to cover immediate requirements. Specifications against contracts are encouraging. Considerable small business has been placed for the second quarter at 2.20c., Pittsburgh. However, big buyers and regular customers are being protected at the old price of 2.10c. on second quarter contracts. There has been an increase in inquiries.

Connellsville furnace, \$3.25 to \$3.75; foundry, \$4.25 to \$5.00; New River foundry, \$8.00 to \$8.50; Wise County furnace, \$4.00 to \$5.00; foundry, \$4.50 to \$6.00; by-product foundry, \$6.50 Connellsville basis.

Tin Plate.—Can manufacturers have been filing specifications covering their needs for the second quarter and dealers are well satisfied with the volume of orders. Present indications point to a record canning season and can manufacturers report increased production by their plants. The price of tin plate is strong at \$5.50 per base box.

Sheets.—Weakness continues in the local market due to keen competition between sellers and to the lack of demand among buyers. Consumers are purchasing little at present. When they do come into the market, they buy in small quantities and insist upon speedy delivery. Second quarter business has been slow in developing. Specifications against contracts continue to be fair. Prices are still soft. Galvanized sheets are quoted at 4.75c., Pittsburgh, for second quarter delivery, but sales are being made at 4.60c. for immediate business. It is reported that quotations under this price have been made locally. Black sheets have also suffered from severe competition among sellers. The price of 3.60c., Pittsburgh, is merely nominal. Sales for quick shipment are being made at 3.50c., while it is reported that several firms have offered tonnage at 3.40c., although this is scarcely representative of the present market. Sales of blue annealed sheets have increased slightly. The price remains at 2.70c. Demand for auto sheets is quiet. They are quoted at 4.60c. Sheet mills in Cincinnati territory state that they have a good volume of orders and they are operating on a satisfactory basis.

Warehouse Business.—Improvement has been noted in the volume of orders and in the number of inquiries. Tonnage is still light, although it is increasing. Most companies believe that March business will be about on a par with February. There are several large concerns that report a marked upward movement in sales in the past ten days. Dealers handling hoops and bands state that business has been spasmodic. Increased sales of wire have been made lately. Prices are strong.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, \$3.25 per 100 lb.; common wire nails, \$3.25 per keg base; cement coated nails, \$2.65 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes, prices net per 100 ft., lap welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Wire Products.—Price concessions in nails continues and the market is still exceptionally weak. The list price of nails is 2.95c., Pittsburgh, but this quotation has practically been discarded. Orders are being taken at 2.85c. and it is reported that some contracts are being made at 2.75c. Demand is light and consumers are

well stocked for present requirements. Shading of prices has developed also in the wire market. The price of 2.70c., Pittsburgh, is not being adhered to by local dealers. A large company here states that orders have been lost on a bid of 2.60c., which was not low enough to secure some of the business closed the past week.

Coke.—The coke market is weak. Prices of domestic coke have been reduced 50c. Foundry coke sales are scattered. Specifications against contracts in March showed a decrease as compared with February. The Louisville & Nashville Railroad purchased 850 tons of coke during the past week. The New York Central has an inquiry out for about 300 tons.

Old Material.—The scrap market is exceptionally weak. Consumers are buying little and inquiries are scarce. However, several dealers report that their sales in March show a slight gain over February. The Pennsylvania and New York Central have lists out which will close shortly. Prices on many items have declined 50c. during the past week.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel.....	\$14.00 to \$14.50
Scrap rails for melting.....	14.00 to 14.50
Short rails.....	18.00 to 18.50
Relaying rails.....	28.00 to 28.50
Rails for rolling.....	15.50 to 16.00
Old car wheels.....	14.00 to 14.50
No. 1 locomotive tires.....	17.00 to 17.50
Railroad malleable.....	16.50 to 17.00
Agricultural malleable.....	15.00 to 15.50
Loose sheet clippings.....	11.00 to 11.50
Champion bundled sheets.....	12.50 to 13.00
Per Net Ton	
Cast iron borings.....	9.00 to 9.50
Machine shop turnings.....	8.50 to 9.00
No. 1 machinery cast.....	17.50 to 18.00
No. 1 railroad cast.....	15.50 to 16.00
Iron axles.....	22.00 to 22.50
No. 1 railroad wrought.....	11.50 to 12.00
Pipes and flues.....	7.50 to 8.50
No. 1 busheling.....	10.00 to 10.50
Mixed bushelings.....	9.00 to 9.50
Burnt cast.....	10.00 to 10.50
Stove plate.....	10.50 to 11.00
Brake shoes.....	11.50 to 12.00

St. Louis

Tennessee Iron Sold at \$18.50 Has Weakening Influence on the Market

ST. LOUIS, March 31.—Additional sales of Tennessee iron on the basis of \$18.50, Birmingham, were made this week to stove plants in the district. The St. Louis Coke & Iron Co. sold about 4000 tons for second quarter shipment in eight lots—the largest being 3000 tons to a St. Louis steel maker. The effect of the cut in Southern iron has been to weaken the market and cause a let-up in buying by melters who are uncertain as to whether there will be further declines. Other Southern makers, Chicago and Granite City concerns quote nominally unchanged prices, but it is believed that the offer of any considerable tonnage would bring about concessions. The only pending inquiry as the opening of the second quarter nears, is 500 tons of foundry iron for a St. Louis machinery manufacturer.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Florence and Sheffield (rail and water), \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City.

Northern fdy., sil. 1.75 to 2.25...	\$26.16
Northern malleable, sil. 1.75 to 2.25.....	26.16
Basic.....	26.16
Southern fdy., sil. 1.75 to 2.25 (rail).....	\$23.67 to 27.17
Southern fdy., sil. 1.75 to 2.25 (rail and water).....	25.28
Granite City iron, sil. 1.75 to 2.25.....	25.81 to 26.31

Coke.—The demand for foundry coke is holding up fairly well, but nearly all the business is being done by by-product producers in the district. A number of water gas contracts expiring April 1, have been pending. There is no buying of domestic coke.

Finished Iron and Steel.—The Harris Abattoir, Winnipeg, Man., 1000 tons, has been awarded to a Chicago distributor of reinforcing bars. Fabricators of structural steel report conditions extremely dull, no business being placed in several months and no jobs of conse-

quence pending. The Laclede Steel Co. got the contract for 200 tons of reinforcing bars for an apartment house at Union and Washington Boulevards. The Missouri Highway Commission opened bids Saturday for road and bridge projects, requiring about 900 tons of bars and 526 tons of structural steel. Warehouse business and other lines are dull.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.50c.; galvanized steel sheets, No. 28, 5.80c.; black corrugated sheets, 4.95c.; galvanized, 5.95c.; cold-rolled rounds, shafting and screw stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, $\frac{1}{2}$ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

Old Material.—An East Side concern has bought 1500 tons of cast steel which was the only transaction of the week. Some of the St. Louis consumers are curtailing operations, and none of them is buying except what is needed for immediate requirements. Dealers being unable to market old material are reducing their paying prices, and the market is off from 25c. to \$2 per ton—the latter being a decline on iron rails for which there is no market here. The railroad lists include the following: Wabash, 1500 tons of miscellaneous rails; Pennsylvania System, 4000 tons; Chicago, Milwaukee & St. Paul, 3500 tons; Union Pacific, 2500 tons; Chicago, Burlington & Quincy, 2500 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails.....	\$15.50 to \$16.00
Rails for rolling.....	18.00 to 18.50
Steel rails less than 3 feet.....	18.50 to 19.00
Relaying rails, 60 lb. and under.....	25.00 to 26.00
Relaying rails, 70 lb. and under.....	32.50 to 33.50
Cast iron car wheels.....	16.50 to 17.00
Heavy melting steel.....	15.50 to 16.00
Heavy shoveling steel.....	15.50 to 16.00
Frogs, switches and guards cut apart.....	14.50 to 17.00
Railroad springs.....	19.50 to 20.00
Heavy axles and tire turnings.....	13.00 to 13.50
No. 1 locomotive tires.....	18.25 to 18.75
Per Net Ton	
Steel angle bars.....	15.25 to 15.75
Steel car axles.....	18.00 to 18.50
Iron car axles.....	25.00 to 25.50
Wrought iron bars and transoms.....	18.75 to 19.25
No. 1 railroad wrought.....	14.00 to 14.50
No. 2 railroad wrought.....	13.75 to 14.25
Cast iron borings.....	11.75 to 12.25
No. 1 busheling.....	13.00 to 13.50
No. 1 railroad cast.....	17.00 to 17.50
No. 1 machinery cast.....	18.50 to 19.00
Railroad malleable.....	14.25 to 14.75
Machine shop turnings.....	8.00 to 8.50
Champion bundled sheets.....	9.00 to 9.50

Buffalo

Pig Iron Prices Weak, but Outlook Is More Encouraging

BUFFALO, March 31.—Current inquiry runs about 7500 tons with a 2000-ton lot of foundry from New England, the principal business offering. The Gould Coupler Co.'s basic requirement of 2000 tons has been placed, and one furnace company reports bookings last week of over 5000 tons, including one order of 1000 tons of foundry for a New York State foundry. Other inquiry this week includes two 500-ton lots of foundry, one of these from a western New York melter. Furnacemen are endeavoring to obtain \$21.50 base for their product, but the going price is really \$21. Furnaces, nevertheless, are more encouraged over conditions this week. By far the preponderant portion of the inquiry during the week was from the small melter. A heavy general booking is reported with a great many carload lots involved. This indicates to the furnaces that many foundries are short of iron and must buy as soon as the least show of business warrants.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25.....	\$21.00 to \$21.50
No. 2X foundry, sil. 2.25 to 2.75.....	21.50 to 22.00
No. 1 foundry, sil. 2.75 to 3.25.....	22.00 to 22.50
Malleable, sil. up to 2.25.....	21.00 to 21.50
Basic.....	21.00
Lake Superior charcoal.....	22.25

Finished Iron and Steel.—Specifications for March were better than for the previous 30 days. Mill operations range from 70 to 85 per cent for the most part with at least one steel maker touching 100 per cent. The bar and shape price of 2.365c. delivered Buffalo is holding, as are the 3.50c. and 4.60c. prices for black and pickled sheets. Both these latter prices include freight allowances. Reinforcing bar business up for bidding includes one lot for the new Elks' club, in Buffalo. The amount is not known but structural shapes up to 800 tons will probably be required. A 160-ton contract for wire mesh for roads has been let, and inquiries for the same material for four other State roads total 300 tons.

Warehouse prices are being quoted as follows: Steel bars, 3.30c.; steel shapes, 3.40c.; steel plates, 3.50c.; No. 10 blue annealed sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.85c.; cold rolled shapes, 4.70c.; cold rolled rounds, 4.20c.; wire nails, 4.00c.; black wire, 4.05c.

Old Material.—Heavy melting steel is just a little bit stronger than it was. Dealers say that a tonnage of this material would command \$17 to \$17.50 from one mill in particular, if a supply were procurable. This particular mill has made heavy purchases over the past few months, but its requirements are heavy. Other mills are not active in purchasing and so far as they are concerned, the lull continues. Demand for the specialties is at a minimum. No. 1 machinery cast market is dead. A mill which has been operating its four open hearths at capacity is about to reduce this number to three.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	.....\$16.75 to \$17.50
Low phosphorus	.....19.00 to 20.00
No. 1 railroad wrought	.....15.00 to 15.50
Car wheels	.....18.50 to 19.50
Machine shop turnings	.....11.50 to 12.00
Cast iron borings	.....12.00 to 12.50
No. 1 busheling	.....15.50 to 16.00
Stove plate	.....15.00 to 15.25
Grate bars	.....13.00 to 13.50
Bundled sheets	.....12.00 to 12.50
Hydraulic compressed	.....15.50 to 16.00
Railroad malleable	.....18.00 to 18.50
No. 1 cast scrap	.....17.00 to 17.50
Iron axles	.....27.00 to 28.00
Steel axles	.....17.50 to 18.00

Cleveland

Lower Prices on Semi-Finished Steel—Fair Business in Finished Material

CLEVELAND, March 31.—Mills report some gain in orders for finished steel during the past week and the tonnage booked by some of the producers in March shows an increase over February. Practically all tonnage covered by first quarter contracts has been specified against and second quarter specifications are coming out. Sentiment in the trade has improved during the past week or two and a gain in the volume of steel business in the second quarter over the first quarter is looked for. Mills are getting a fair volume of current orders in small lots, largely for steel bars.

In the automotive industry, some of the larger car builders are now operating at capacity and April production will show considerable gain over any previous month this year. However, automobile companies are not releasing material far ahead. One reason for this is that they are securing good deliveries. In other metal working lines, plants are fairly busy, but as a rule have not much work ahead.

There is little change in the price situation. Steel bars and structural material are firm at 2.10c., Pittsburgh. While plate mills have to go to 2c. for Eastern shipment, the 2.10c. price is apparently being maintained in this territory. Hot-rolled strip steel in wide material lacks firmness and is quoted at 2.20c., but on hoops and bands and strips 6 in. and narrower, 2.40c. is being maintained.

Pig Iron.—The brightest side of the market is the increased demand from the automotive industry which will take considerably more iron in April than in any

month of the first quarter. Conditions are spotty in other industries. Some foundries will carry over to the second quarter much first quarter iron bought at around \$20 last November, but in a few cases foundries are taking iron faster than their monthly quotas call for. The market generally is quiet. Most foundries in this territory that need iron, as a rule, are buying only in small lots for early requirements, but there is more activity in western Ohio, where two 1000-ton lot sales are reported, one of malleable iron and one of foundry and malleable. One Lake furnace sold 4000 tons during the week. Inquiries include 2000 tons from western Pennsylvania and 1000 tons from Indiana, both foundry grades. Prices are unchanged. Cleveland foundries are holding to \$23 at furnace for foundry iron for local delivery, or 74c. above the delivered price in Cleveland on Valley iron at \$21. The Lake furnace price in western Ohio and Michigan is \$22. Southern foundry iron is being offered by Tennessee furnaces at \$19.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace	.....\$21.00
N't'n No. 2 fdy., sil. 1.75 to 2.25	.....\$23.00 to 23.50
Southern fdy., sil. 1.75 to 2.25	.....26.01 to 27.01
Malleable	.....23.00 to 23.50
Ohio silvery, 8 per cent.	.....32.52 to 33.52
Standard low phos., Valley furnace	.....28.50

Iron Ore.—Ore prices for the season will probably be established within the next few days. There appears to be as much uncertainty as ever whether last season's prices will prevail or whether a slight reduction will be made from the 1924 schedule.

Semi-Finished Steel.—The sheet bar market is now definitely established at \$37, Youngstown, for the second quarter. On billets and slabs \$35.50, Youngstown, is the asking price, but slabs can probably be purchased at \$35. A Cleveland mill has reduced its price to \$37.50, Cleveland, on sheet bars and to \$36.50 on billets and slabs. There is not much inquiry and some buyers have decided to withhold orders until they are satisfied that prices will go no lower. During the week before the lower price appeared, a Cleveland consumer bought 25,000 tons of slabs at \$37, Youngstown. The same consumer also purchased 4000 tons of ingots at \$32, Youngstown. Large tonnages of sheet bars are being carried over on first quarter contracts and shipments of this material will be made at the \$37 price at which the contracts were taken. In cases where first quarter sales were made subject to trade paper quotations, the steel carried over to the second quarter will be billed at the quotations prevailing at the time of shipment.

Sheets.—There has been little activity since the buying by the Detroit automobile companies two weeks ago and some of the mills are in need of orders. Prices remain at about recent levels, although galvanized sheets are slightly weaker with quotations ranging from 4.50c. to 4.60c. Black sheets range from 3.40c. to 3.50c. On blue annealed sheets, 2.60c. is the more common price, although some business is being taken at 2.70c. Auto body sheets are holding to 4.40c.

Reinforcing Bars.—The demand is not active and the price is unchanged at 1.90c. to 2c. on rail steel bars. The Franklin Steel Works has taken 120 tons for the Neal Fireproof Storage Co., Cleveland.

Bolts, Nuts and Rivets.—Makers are getting a good volume of specifications on contracts for early requirements, consumers not ordering for far ahead. Most consumers and jobbers have placed second quarter contracts. The demand for small bolts is much better than for large bolts. Bolt and nut plants are operating at from 70 to 75 per cent of capacity. Regular prices are firm. The demand for rivets is slow. With the establishment of a 2.60c. price for the second quarter, makers are entering a good number of contracts for the quarter.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3.25 per 100 lb.; No. 9 galvanized wire, \$3.70 per 100 lb.; common wire nails, \$3.35 base per 100 lb.

Coke.—The market is very quiet, most foundries buying from hand to mouth. Prices are unchanged at 4.25c. to 5.50c. for standard Connellsville foundry coke.

Old Material.—The increased operation of automobile plants is being reflected in the large increase in the tonnages offered in the April scrap lists of the Detroit automobile companies. Bids on offerings of several of the larger companies will be received during the week. The material is mostly borings and turnings. The market is very dull and prices are weaker, having declined from 25c. to 50c. a ton on most grades. There is virtually no demand from consumers. In the Valley district, heavy melting steel is quoted at \$18.50 and compressed sheet steel at \$16.50.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	\$16.25 to \$16.50
Rails for rolling	16.50 to 16.75
Rails under 3 ft.	18.75 to 19.00
Low phosphorus melting	19.00 to 19.50
Cast iron borings	13.50 to 13.75
Machine shop turnings	13.50 to 13.75
Mixed borings and short turnings	13.50 to 13.75
Compressed sheet steel	14.00 to 14.25
Railroad wrought	12.25 to 12.75
Railroad malleable	19.00 to 19.50
Light bundled sheet stampings	12.00 to 12.25
Steel axle turnings	14.50 to 14.75
No. 1 cast	18.25 to 18.75
No. 1 bushing	13.25 to 13.50
Drop forge flashings	12.25 to 12.50
Railroad grate bars	14.00 to 14.25
Stove plate	14.00 to 14.25
Pipes and flues	9.50 to 10.00

Canadian Scrap Market Is Extremely Dull

TORONTO, ONT., March 30.—Trading in iron and steel scrap in the Canadian market has again reverted to a state bordering on stagnation. New business is dull and melters are showing interest in the market only when material is required for immediate use. Practically no change has appeared in the daily melt and as a result consumers are not placing contracts for scrap on future account, but in nearly all cases are confining their buying to hand-to-mouth needs. During the past couple of weeks, the greater part of the scrap demand was from steel mills in the Hamilton, Ont., district, to which center dealers say a steady flow of scrap is continually on the move, a large part of which is accounted for as a result of orders against old contract. In the Montreal district the iron and steel scrap market, in so far as local demand is concerned, is practically at a standstill. There has been, however, a slight improvement in demand for scrap on export account. During January iron and steel scrap exports from this country amounted to 9484 tons, which compares with 5895 tons for the corresponding month of 1924.

The failure of foundries to increase operations in keeping with predictions made earlier in the year is given by dealers as the chief reason for the present quiet state of the market. In most cases foundries are operating only about 50 per cent capacity, with an occasional jobbing foundry running about 60 or 70 per cent. Dealers report no change in prices for the week. Dealers' buying prices are as follows:

	Gross Tons	
	Toronto	Montreal
Steel turnings	\$11.00	\$10.00
Machine shop turnings	11.00	9.00
Wrought pipe	7.00	8.00
No. 1 wrought scrap	13.00	13.00
Heavy melting steel	12.75	12.00
Steel axles	16.00	18.00
Axles, wrought iron	18.00	20.00
	Net Tons	
Standard car wheels	16.00	16.00
Malleable scrap	14.00	16.00
Stove plate	14.00	13.00
No. 1 machinery cast	18.00	18.00

Awards totaling \$39,531 were paid to 3244 employees of the General Electric Co. during 1924 for suggestions which increased the efficiency of the company's operations. The suggestions ranged from those covering safety devices for the protection of workers to ideas on improved methods of manufacturing electrical apparatus, and the awards ranged from \$1 to \$1,000. In 1923, \$22,988 was distributed to 1752 employees and the highest award was \$500.

Philadelphia

Foundry Pig Iron Drops a Dollar Per Ton on Sales of 1500 Tons

PHILADELPHIA, March 31.—A sharp break in the price of foundry pig iron is the only event of importance in a dull market. The price declined \$1 a ton on sales of about 1500 tons to a soil pipe manufacturer. Three furnaces participated in the business. The demand for finished steel is exceedingly light, but shipments continue at a fairly good rate in most lines. Scrap is dull and weak.

Pig Iron.—After buying a few carloads of foreign iron at \$22 and \$22.50 per ton, a manufacturer of soil pipe late last week negotiated for 1500 tons of domestic foundry iron and succeeded in getting three furnaces to take the business at a base price of \$22, a drop of \$1 a ton from the minimum at which the market had been maintained for at least two weeks previously. Some of the iron to be shipped is said to be off grade, but a good share of it is to be standard No. 2 plain and No. 2 X. No other sales of importance are reported, and on the carload lots which predominate in current business the furnaces are attempting to obtain \$22.50 or \$23, base. There have been no transactions in basic, but the new trend of foundry iron prices discloses that basic could also be purchased at not more than \$22, furnace. While low-priced sales of foreign iron were directly responsible for the break in the domestic iron price, sellers of foreign iron say that there is little, if any, of the imported iron available at such low figures as \$22 or \$22.50, f.o.b. cars Philadelphia. The particular lots sold at these prices were "distress" iron which had to be moved promptly and no more is available at the moment. A good deal of the iron which is to arrive within the next few weeks has been sold. One importer of Indian iron has sold all that will come to him within the next month. The Delaware River furnace at Chester will go into blast on April 20.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rate varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25	\$22.76 to \$23.63
sil.	23.26 to 24.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.26 to 25.63
East. Pa. No. 1X	
Virginia No. 2 plain, 1.75 to 2.25	29.17 to 29.67
sil.	29.67 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	22.75 to 23.25
Basic delivered eastern Pa.	23.00 to 23.50
Gray forge	24.00 to 24.50
Malleable	
Standard low phos. (f.o.b. furnace)	25.00 to 26.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00

Various grades of foreign pig iron are being offered at approximately the prices quoted below, all quotations being f.o.b. cars, Philadelphia:

Indian foundry iron, 2 to 2.50 per cent sil.	\$23.50 to \$24.00
Indian foundry iron, 2.25 to 3 per cent sil.	24.00 to 24.50
English foundry iron, 2 to 2.50 per cent sil.	23.00 to 23.50
Continental foundry, 2.50 to 3 per cent sil.	23.00 to 23.50
English low phos., copper free	26.00

Ferromanganese.—Only occasional carload lots of ferromanganese are being sold at the current price of \$115, seaboard or furnace.

Billets.—Demand for billets is exceedingly light. Rerolling billets are to be had at from \$37 to \$37.50, Pittsburgh base, and forging billets are \$5 higher.

Plates.—Considerable work has been placed with Atlantic Coast shipyards, which means the buying of fairly good-sized lots of plates, but Eastern mills will probably not benefit from this business, most of which will go to the Carnegie Steel Co. The New York Shipbuilding Corporation will require about 2500 tons of plates for six barges it will build for the Reading Railroad. The Cramp shipyard will build for the City of Philadelphia eight dump barges, requiring 1500 tons of plates. The Newport News Shipbuilding & Dry Dock Co. is to build three steamers for the Merchants' and Miners' Transportation Co. and a boat for the District

of Philadelphia, United States Government, and these jobs will take several thousand tons of plates. The Florida East Coast Railroad is inquiring for 21 locomotives. Despite the keen competition for plate orders and the small amount of tonnage to be had, the price has held fairly well at 2c., Pittsburgh base. In fact, there is no evidence that this figure has been shaded, although some buyers have been strenuous in their efforts to obtain concessions.

Structural Shapes.—A ragged price situation prevails in structural shapes and some of the prices reported are so far below what is generally regarded as the "market" that it is impossible to confirm them. Nominally quotations remain at 2c., Pittsburgh, or 2.32c., Philadelphia, but this price applies only on the smaller lots and anything especially desirable brings out quotations at least \$1 or \$2 a ton lower.

Bars.—Steel bars remain firm at 2.10c., Pittsburgh, or 2.42c., Philadelphia. New business is of small proportions, but specifications on contracts have come to the mills fairly well in the past week and there are good rollings ahead. Bar iron mills are not operating at more than 50 per cent and orders are small. The bar iron price remains unchanged at 2.28c., Philadelphia.

Sheets.—There is still a lack of clarification of sheet prices, and a spread of about \$2 a ton exists in the prices quoted by various mills. Blue annealed sheets are being sold at from 2.60c. to 2.70c., Pittsburgh, and there is a fair volume of business, due to some extent to the continuation of the strike at the Conshohocken works of the Alan Wood Iron & Steel Co. Black sheets are to be had at 3.40c. to 3.50c. and galvanized sheets at 4.60c. or 4.65c., with intimations that even the lower figure has been shaded.

Warehouse Business.—Local warehouses quote the following prices for steel products out of stock:

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, $1\frac{1}{2}$ x $\frac{1}{4}$ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, $\frac{1}{4}$ in. and heavier, 3.10c.; tank steel plates, $\frac{3}{8}$ in., 3.25c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.85c.; galvanized sheets, No. 28 gage, 6c.; square, twisted and deformed steel bars, 2.85c.; structural shapes, 3.10c.; diamond pattern plates, $\frac{1}{4}$ -in., 5.30c.; $\frac{3}{8}$ -in., 5.50c.; spring steel, 5c.; round cold-rolled steel, 4.15c.; squares and hexagons, cold-rolled steel, 4.65c.; steel hoops, 4.20c. base; steel bands, No. 12 gage to $\frac{3}{8}$ in., inclusive, 3.95c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—Further declines in prices of various grades of old material point clearly to the continued weakness of that market. In some quarters, not more than \$15.50 is obtainable for heavy melting steel, that being the price that one or two brokers are offering on old orders. The prices quoted below show reductions of from 50c. to \$1 a ton on many items.

We quote for delivery consuming points in this district as follows:

No. 1 heavy melting steel.....	\$15.50 to \$16.50
Scrap rails	15.50 to 16.50
Steel rails for rolling	18.50 to 19.00
No. 1 low phos. heavy 0.04 and under	20.00 to 21.00
Couplers and knuckles.....	19.00 to 20.00
Rolled steel wheels.....	19.00 to 20.00
Cast-iron car wheels.....	18.00 to 19.00
No. 1 railroad wrought.....	18.50 to 19.50
No. 1 yard wrought.....	17.00 to 18.00
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	13.00
Mixed borings and turnings (for blast furnace use).....	12.00 to 12.50
Machine shop turnings (for steel works use)	13.00
Machine shop turnings (for rolling mill use).....	13.50
Heavy axle turnings (for equivalent)	14.50 to 15.50
Cast borings (for steel works and rolling mill)	14.00 to 14.50
Cast borings (for chemical plants)	18.00 to 18.50
No. 1 cast	18.00 to 19.00
Heavy breakable cast (for steel plants)	16.00 to 16.50
Railroad grate bars.....	13.50
Stove plate (for steel plant use)	13.50
Wrought iron and soft steel pipes and tubes (new specifications)	16.00
Shafting	21.00 to 22.00
Steel axles	22.00 to 23.00

Imports.—Philadelphia imports of pig iron last week totaled 5628 tons, of which 3575 tons came from

Germany, 1003 tons from British India, 1000 tons from England and 50 tons from Sweden. There were large receipts of iron ore, 13,220 tons from Spain and 7400 tons from Algeria. Belgium shipped in 180 tons of steel blooms and 203 tons of iron bars came from France.

CANADIAN IRON LOWER

Quotations at Toronto and Montreal Reduced— Buying Not Stimulated

TORONTO, ONT., March 30.—A further softening in price has featured the Canadian pig iron market, following the decline of \$1 per ton which went into effect March 9. The latest reduction, which was \$1.20 per ton in Toronto and Montreal districts went into effect March 28, leaving the present Canadian pig iron prices as follows: No. 1 (2.25 to 2.75 silicon) \$26.60; malleable, \$26.60; No. 2 (1.75 to 2.25 silicon), \$26.10, Toronto; with Montreal prices as follows, No. 1 and malleable, \$29, and No. 2, \$28.50. The recent reduction in prices is the result of the softening tendency that has affected the Buffalo pig iron quotations, together with the stagnant demand for iron that now prevails in this market. While a few melters have placed contracts for second quarter requirements, the large majority are buying on a hand-to-mouth basis and are showing no great hurry to cover for the next three months. The reducing of prices has not stimulated the demand in any way, but on the contrary appears to have been a factor in making the market even more unsettled. Local blast furnace representatives report a small demand for foundry iron on spot account ranging from 50 to 100 tons to an order, while at the same time they say that they have been receiving a steady flow of orders against old contract and that the movement of pig iron between producers and consumers runs into a fairly high weekly average.

Canadian steel mills are busy on rail orders, rolling being carried on at capacity at Sault Ste. Marie, Ont., and at Sydney, N. S. These activities have greatly stimulated the production of basic iron for the further use of producing concerns and it is expected that the output of basic iron for March will practically double that of the previous month. In so far as foundries are concerned, no change has appeared in operations during the week, and as a consequence the daily iron melt also remains unchanged.

While pig iron selling interests are looking forward to a better demand for iron during the present quarter than prevailed during the first three months of this year, there is no outstanding sign which actually tends towards such improvement, outside the improved conditions which have recently appeared in the activities of Canadian mills.

Detroit Scrap Easier

DETROIT, March 30.—Somewhat easier prices have developed on practically all lines of old material. Producers report the demand as less active and consumers are either buying sparingly or showing a disposition to stay out of the market.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel.....	\$14.00 to \$15.00
Borings and short turnings.....	11.25 to 12.00
Long turnings	11.00 to 11.75
No. 1 machinery cast	17.50 to 18.00
Automobile cast	21.00 to 22.00
Hydraulic compressed	12.25 to 13.25
Stove plate	15.50 to 16.50
No. 1 busheling.....	12.50 to 13.00
Sheet clipping	11.00 to 11.50
Flashings	12.50 to 13.00

A permit to erect a foundry at a cost of \$10,000 has been taken out by the J. W. Pohlman Foundry Co., Buffalo.

ABANDONS SEVERAL MINES

Pittsburgh Coal Co. Finds Cost of Operating Union Mines Too High

As the Pittsburgh Coal Co. senses a condition that means the continuance of the existing wide disparity between coal producing costs in union and non-union operations and that it cannot make a profit in the operation of mines worked under an agreement with United Mine Workers of America, it has announced the abandonment of 16 of its 54 mines in the Pittsburgh district. These mines, although idle since a year ago, have been kept in shape for operation at an expense, according to C. E. Leshner, assistant to the president, of \$500,000 a year.

"These mines," the official statement of the company says, "with many others in the field, have been idle since early in 1924, and the expense of ventilating

and pumping and otherwise keeping them in condition to produce coal will now be saved. Each of these mines is surrounded by a town of mine workers who have been dependent on the mines for their livelihood. Rails and copper wire and all machinery and pit cars are being rapidly removed from these 16 mines and the tipples are being wrecked.

"With one or two exceptions, these mines were operated prior to 1924 and their abandonment was decided on only after it became evident that the high costs of production as compared with the non-union Southern coal fields would prevent their operation in the future.

"The Pittsburgh Coal Co., with many large docks on the upper Great Lakes, until last year regularly shipped several million tons of coal to the lakes, but in 1924 it purchased West Virginia coal for this purpose and, it is stated by high officials of the company, will purchase even more this year instead of operating its mines."

Wheeling Mold & Foundry Co. Had a Moderate Loss Last Year

H. E. Field, president, Wheeling Mold & Foundry Co., Wheeling, in his remarks at the annual stockholders' meeting in Wheeling, March 26, explained that a deficit of approximately \$150,000 for the year ended Dec. 31, last, resulted from reduced operations, competitive prices and the charging off of a number of doubtful accounts. In reviewing the year's results he said:

Warwood plant has been running over its normal capacity during the entire year on chilled rolls on a very profitable basis. The purchase of this plant and the transferring of our chilled roll business under a separate head has proven to have been a wise arrangement, and has more than justified our action in doing so, in spite of the fact that it decidedly depleted our surplus.

Peninsula plant operated on an average of 50 per cent during the year on steel and iron castings and finished material. The decided slump in business during the middle of the year, however, prevented us realizing our hopes of a profitable year as predicted at our last annual meeting. This decreased operation during the middle of the year combined with the competitive prices which ruled during the year, accounts for the loss shown in our treasurer's statement.

In our last report we spoke of the loss of Navy work due to the disarmament program as greatly handicapping our operation. We are pleased to state that we have added during the year as customers, builders of hydro-electric machinery, which will eventually make up for the loss in this department. We have also gone into the manufacture of locomotive frames with such success that we can prophesy that in the near future this will be one of our principal lines.

All the plants are in excellent physical condition, and all buildings and machinery have been kept in excellent repair. In December we changed over to the profit side again, and January and February figures show a decidedly improved net profit.

An instructive address on engineering standards, with particular reference to the standardization of fits and tolerances, was made by Major Earle Buckingham, engineer of standards, Pratt & Whitney Co., Hartford, at a meeting of the metropolitan section of the American Society of Mechanical Engineers, held at the Down Town Club, Newark, N. J., March 25. The meeting, which was under the auspices of the society's machine-shop practice division, was presided over by W. F. Dixon, chairman of that division and works manager of the Singer Mfg. Co., Elizabethport, N. J. There was good attendance and active discussion.

Automobile production schedules are running over 90 per cent of capacity, according to *Automotive Industries*. In a few plants night shifts have been put on to meet the demand.

Meeting of Philadelphia Foundrymen's Association

The next meeting and dinner of the Philadelphia Foundrymen's Association will be held at the Manufacturers' Club on Wednesday evening, April 8. Entertainment will be provided, and Mr. Heisserman of the Link Belt Co., Nicetown plant, is scheduled to deliver an illustrated lecture on "How to Reduce Cost of Production in Iron, Steel, Malleable and Brass Foundries and Machine Shops."

William G. Summers, assistant purchasing agent of the Phoenix Iron Co., 410 Walnut Street, Philadelphia, is the newly elected treasurer of the association.



W. G. SUMMERS

Rolled Zinc in 1924

Production of rolled zinc last year is reported by the United States Geological Survey as the largest since 1918, which was the record year. The output was 9 per cent greater than in 1923. The total amount is reported at 61,032 net tons, compared with 55,833 tons in 1923. The total in 1924 was almost equally divided between sheet zinc not over 0.1 in. thick, with 29,517 tons, and strip and ribbon zinc, with 30,524 tons. The remainder, 991 tons, consisted of boiler plate and sheets over 0.1 in. thick. Imports were negligible, having been less than 1 ton. Exports amounted to 3658 tons, leaving 57,375 tons available for consumption compared with 52,102 tons similarly available in 1923.

Average values per pound are given as 9.5c. for the rolled zinc in 1924, against 9.1c. in 1923, the total values having been respectively \$11,552,354 in 1924 and \$10,164,981 in 1923. Exported zinc is quoted somewhat higher than the figure for rolled zinc, having been 10.7c. per lb. in 1924 and 10.2c. in 1923.

Youngstown Scrap Market

YOUNGSTOWN, March 31.—Heavy melting scrap has settled to a basis of \$18 in this district, at which sales have recently been made by middle interests. Dealers are holding purchases in check in view of some uncertainty with respect to demand from melters.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....	2c. to 2.10c.
F.o.b. Chicago, base, per lb.....	2.30c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....	2.10c.
F.o.b. Chicago, base, per lb.....	2.30c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....	2.10c.
Soft steel bars f.o.b. Chicago, base, per lb.....	2.20c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb.....	2.10c.
Rail steel bars, f.o.b. Chicago district mills, base, per lb.....	2.10c.
Common iron bars, f.o.b. Chicago, base, per lb.....	2.10c.
Refined iron bars, f.o.b. P'gh mills, base, per lb.....	3c. to 3.10c.
Common iron bars, eastern Pa. mill, base, per lb.....	2.10c.

Hot-Rolled Flats

Hoops, base, per lb., Pittsburgh.....	2.40c.
Bands, base, per lb., Pittsburgh.....	2.40c.
Strips, 6 in. and narrower, base, per lb., Pittsburgh.....	2.40c.
Strips, wider than 6 in., base, per lb., Pittsburgh.....	2.20c.
Strips, base, per lb., Chicago.....	2.55c. to 2.60c.

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb.....	2.70c. to 2.80c.
Screw stock and shafting, f.o.b. Chicago, base, per lb.....	2.80c.
Screw stock, base, per lb., Cleveland.....	2.75c. to 2.85c.
Shafting, ground, f.o.b. mill, base, per lb.....	3.20c.
Strips, f.o.b. P'gh mills, base, per lb.....	4c. to 4.15c.
Strips, f.o.b. Cleveland mills, base, per lb.....	4c. to 4.15c.
Strips, f.o.b. Chicago mills, base, per lb.....	4.30c. to 4.45c.
Strips, f.o.b. Worcester mills, base, per lb.....	4.15c. to 4.30c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)	
Nails, base, per keg.....	\$2.85
Galvanized nails, 1-in. and longer, base plus.....	2.25
Galvanized nails, shorter than 1 in., base plus.....	2.50
Bright plain wire, base, No. 9 gage, per 100 lb.....	2.60
Annealed fence wire, base, per 100 lb.....	2.75
Spring wire, base, per 100 lb.....	3.60
Galvanized wire, No. 9, base, per 100 lb.....	3.20
Galvanized barbed, base, per 100 lb.....	3.55
Galvanized staples, base, per keg.....	3.55
Painted barbed wire, base, per 100 lb.....	3.30
Polished staples, base, per keg.....	3.30
Cement coated nails, base, per count keg.....	2.15
*Bale ties, carloads to jobbers...75, 15 and 5 per cent off list	
*Bale ties, carloads to retailers...75, 10 and 6 per cent off list	
Woven wire fence, base, per net ton to retailers.....	\$67.00
Chicago district mill prices are \$2 per ton above the foregoing and Chicago delivered prices are \$3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mills \$3 a ton higher on production of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.	

*F.o.b. Cleveland.

Sheets

Blue Annealed (base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mill.....	2.65c. to 2.70c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills.....	2.70c. to 2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....	3.40c. to 3.50c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....	3.60c. to 3.70c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....	4.50c. to 4.60c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....	4.70c. to 4.85c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....	3.40c. to 3.50c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill.....	3.70c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill.....	4.40c. to 4.50c.
---	------------------

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....	4.90c.
--	--------

Tine Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills.....	\$5.50
Standard cokes, per base box f.o.b. Chicago district mills.....	5.60
Standard cokes, per base box f.o.b. Elwood, Ind.....	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb base.....	\$11.20	30-lb. coating I. C.....	\$15.50
8-lb. coating I. C.....	11.50	25-lb. coating I. C.....	17.00
15-lb. coating I. C.....	14.35	30-lb. coating I. C.....	18.35
		40-lb. coating I. C.....	20.35

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb.....	\$2.60
Large, f.o.b. Chicago, base, per 100 lb.....	2.75
Small, f.o.b. Pittsburgh.....	70, 10, 5 per cent off list
Small, Cleveland ....70 and 10 to 70, 10 and 10 per cent off list	
Small, Chicago	70 to 70 and 10 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....	\$43.00
Rails, light, billet, base, per lb.....	1.80c. to 1.90c.
Rails, light rail steel, base, per lb.....	1.65c. to 1.75c.
Spikes, 1/4 in. and larger, base, per 100 lb.....	\$2.80 to \$3.20
Spikes, 1/4 in. and smaller, base, per 100 lb.....	3.10 to 3.50
Spikes, boat and barge, base, per 100 lb.....	3.25
Track bolts, all sizes, base, per 100 lb.....	3.90 to 4.25
Tie plates, per 100 lb.....	2.35 to 2.50
Angle bars, base, per 100 lb.....	2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Inches	Steel	Galv.	Inches	Iron	Galv.
1/4	45	19 1/2	1/4 to 3/8	+11	+39
1/2 to 3/4	51	25 1/2	1/2	22	2
1	56	42 1/2	3/4	28	11
1 1/2	60	48 1/2	1 to 1 1/2	30	13
1 to 3	62	50 1/2			

Lap Weld

2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

Butt Weld, extra strong, plain ends

1/4	41	24 1/2	2 to 3	61	50 1/2
1/2 to 3/4	47	30 1/2	1/4 to 3/8	+11	+54
1	53	42 1/2	1/2	21	7
1 1/2	58	47 1/2	3/4	28	13
1 to 1 1/2	60	49 1/2	1 to 1 1/2	30	14

Lap Weld, extra strong, plain ends

2	53	42 1/2	2	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	7
9 and 10	45	32 1/2	9 to 12	16	3
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 1/2 points, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2 1/2 per cent beyond the above discount.

Note—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to 2 1/4 in.....	1 1/4 in.....+18
2 1/2 to 2 3/4 in.....	1 1/2 in.....+8
3 in.....	2 to 2 1/4 in.....—2
3 1/2 to 3 3/4 in.....	2 1/2 to 3 in.....—7
4 to 13 in.....	3 1/2 to 4 1/2 in.....—9

Beyond the above discount, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn	
1 in.....	60
1 1/4 and 1 1/2 in.....	52
1 3/4 in.....	36
2 and 2 1/4 in.....	31
2 1/2 and 2 3/4 in.....	39
3 in.....	45
3 1/4 to 3 1/2 in.....	47
4 in.....	50
4 1/2, 5 and 6 in.....	45

Hot-Rolled

2 and 2 1/4 in.....	34
2 1/2 and 2 3/4 in.....	42
3 in.....	48
3 1/4 and 3 1/2 in.....	50
4 in.....	53
4 1/2, 5 and 6 in.....	48

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.....	85 to 87 per cent off list
Carbon 0.30 to 0.40 base.....	83 to 85 per cent off list
Plus usual differentials and extra for cutting. Warehouse discounts range higher.	

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage.....	14 1/4	2 1/4-in. O.D. 10 gage.....	18
2-in. O.D. 11 gage.....	15	3-in. O.D. 7 gage.....	33
2-in. O.D. 10 gage.....	16	1 1/2-in. O.D. 9 gage.....	15
2 1/4-in. O.D. 12 gage.....	16	5 1/2-in. O.D. 9 gage.....	50
2 1/4-in. O.D. 11 gage.....	17	5 1/2-in. O.D. 9 gage.....	52

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports	
Old range Bessemer, 55 per cent iron.....	\$5.65
Old range non-Bessemer, 51½ per cent iron.....	4.90
Mesabi Bessemer, 55 per cent iron.....	5.40
Mesabi non-Bessemer, 51½ per cent iron.....	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	9.50c. to 10c.
Iron ore, Swedish, average 66 per cent iron.....	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus.....	44c.
Manganese ore, Brazilian or Indian, nominal.....	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	\$9.00 to \$11.00
Chrome ore, Indian basic, 48 per cent Cr ₂ O ₃ crude, per ton, c.i.f., Atlantic seaboard....	22.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₃ , New York.....	80c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt.....	\$3.25
Foundry coke, f.o.b. Connellsville prompt.....	\$4.00 to 4.75
Mine run steam coal, f.o.b. W. Pa. mines.....	1.50 to 2.00
Mine run coking coal, f.o.b. W. Pa. mines.....	1.50 to 1.75
Mine run gas coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.25
Gas slack, f.o.b. W. Pa. mines.....	1.30 to 1.40

Ferrolloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	115.00
Ferrosilicon, 50 per cent, delivered.....	\$82.50 to \$85.00
Ferrosilicon, 75 per cent.....	145.00 to 147.50
Ferrotungsten, per lb. contained metal....	90c. to 95c.
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered.....	11.50c.
Ferrovanadium, per lb. contained vanadium.....	\$3.50 to \$4.00
Ferrocobaltititanium, 15 to 18 per cent, per net ton.....	\$100.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 10 to 21 per cent.....	\$32.00
Spiegeleisen, domestic, 16 to 19 per cent.....	32.00
Ferrosilicon, Bessemer, 10 per cent, \$39.50; 11 per cent, \$42; 12 per cent, \$44.50; electric furnace ferrosilicon, 10 to 11 per cent, \$38; furnace with an advance of \$1 per unit for material above 10 per cent.....	
Silvery iron, 5 per cent, \$27.00; 6 per cent, \$28.00; 7 per cent, \$29.00; 8 per cent, \$30.50; 9 per cent, \$32.50; 10 per cent, \$34.50; 11 per cent, \$37.00; 12 per cent, \$39.50.....	

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines....	\$18.00 to \$19.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines....	19.00 to 20.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton.....	18.00
Per 1000 f.o.b. works:	
Fire Clay	
Pennsylvania.....	\$43.00 to \$46.00
Maryland.....	48.00 to 50.00
Ohio.....	43.00 to 46.00
Kentucky.....	43.00 to 45.00
Illinois.....	43.00 to 45.00
Missouri.....	45.00 to 48.00
Ground fire clay, per ton.....	6.50 to 7.50

Silica Brick:	
Pennsylvania.....	40.00
Chicago.....	49.00
Birmingham.....	54.00
Silica clay, per ton.....	8.00 to 9.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland and Chicago)

Machine bolts, small rolled threads... 60 and 10 per cent off list	
Machine bolts, all sizes, cut threads.....	50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads.....	50, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes... 50 and 10 per cent off list	
Eagle carriage bolts.....	65 and 10 per cent off list
Lag bolts.....	60, 10 and 10 per cent off list
Flow bolts, Nos. 1, 2 and 3 heads.....	50 and 10 per cent off list
Other style heads.....	20 per cent extra

Machine bolts, c.p.c. and t. nuts, ½ x 4 in.

45, 10 and 5 per cent off list	
Larger and longer sizes.....	45, 10 and 5 per cent off list
Hot-pressed nuts, blank or tapped, square.....	4c. off list
Hot-pressed nuts, blank or tapped, hexagons.....	4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.....	4.10c. off list
Bolt ends with hot pressed nuts.....	50, 10 and 5 per cent off list
Bolt ends with cold pressed nuts.....	45, 10 and 5 per cent off list
Washers.....	6c. to 5.50c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:	
½ in. and smaller, U. S. S.....	80, 10 and 5 per cent off list
¾ in. and larger, U. S. S.....	75, 10 and 5 per cent off list
Small sizes, S. A. E.....	80, 10, 10 and 5 per cent off list
S. A. E., ½ in. and larger.....	75, 10, 10 and 5 per cent off list
Stove bolts in packages.....	80 and 5 per cent off list
Stove bolts in bulk.....	80 and 5 and 2½ per cent off list
Tire bolts.....	50, 10 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

Per 100 Net		Per 100 Net	
S. A. E.	U. S. S.	S. A. E.	U. S. S.
¼-in.	\$0.44	¾-in.	\$2.35
½-in. ....	.515	1-in.	3.60
¾-in. ....	.62	1½-in.	5.55
1-in. ....	.79	2-in.	8.90
1½-in.	1.01	2½-in.	12.60
2-in.	1.38	3-in.	18.35
2½-in.	1.70	3½-in.	21.00

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws.....	80, 10 and 5 per cent off list
Milled standard set screws, case hardened.....	80 and 10 per cent off list
Milled headless set screws, cut thread.....	80 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread.....	8, 10, 10 and 5 per cent off list
Upset hex. cap screws, S. A. E. thread.....	8, 10, 10 and 5 per cent off list
Upset set screws.....	80, 10 and 10 per cent off list
Milled studs.....	75 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$25.50
Forging billets, ordinary carbon.....	41.00
Sheet bars.....	37.00
Slabs.....	37.00
*Wire rods, common soft, base, No. 5 to ¼-in. 48.00 to 50.00	
Wire rods, common soft, coarser than ¼-in. \$2.50 over base	
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.49.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	2.10c.
Skelp, sheared, per lb.....	2.10c.
Skelp, universal, per lb.....	2.10c.

*Chicago mill base is \$50. Cleveland mill base, \$48 to \$50.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E.	Series	Bars
Numbers		100 lb.
2100*	(¼% Nickel, 10 to 20 per cent Carbon)...	\$3.00 to \$3.25
2300	(3½% Nickel).....	4.50 to 4.75
2500	(5% Nickel).....	6.00 to 6.25
3100	(Nickel Chromium).....	3.50 to 3.85
3200	(Nickel Chromium).....	5.50
3300	(Nickel Chromium).....	7.50 to 7.75
3400	(Nickel Chromium).....	6.50 to 6.75
5100	(Chromium Steel).....	2.50
5200*	(Chromium Steel).....	7.50 to 8.00
6100	(Chromium Vanadium bars).....	4.25 to 4.50
6100	(Chromium Vanadium spring steel).....	4.25
9250	(Silicon Manganese spring steel).....	2.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium).....		4.25 to 4.50
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....		4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....		4.25
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....		3.75
Chromium Molybdenum spring steel (1—1.35 Chromium, 0.20—0.50 Molybdenum).....		4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

FABRICATED STEEL BUSINESS

Business and Industrial Buildings Bulk Large in Bookings; Public Work in Inquiries

Of the 20,000 tons of bookings of fabricated steel work reported to THE IRON AGE in the past week, nearly 9000 tons were for industrial buildings and 4250 tons for business buildings. Fresh inquiries appeared for 27,000 tons, about 75 per cent of it for public work, including 17,000 tons for transportation tunnel work in New York. Awards include:

Morrow Realty Co., loft building on West Thirty-sixth Street, New York, 1300 tons, to A. E. Norton, Inc.
Dwaman office building, Brooklyn, 600 tons, to Hedden Iron Construction Co.

Public school No. 63, Brooklyn, 800 tons, to A. E. Norton, Inc.

Jerry O. Mahoney, Elizabeth, N. J., shop building, 200 tons, to Levering & Garrigues Co.

State highway bridge at Ellaville, Fla., 225 tons, to a local fabricator.

Hudson Valley Coke Products Corporation, Troy, N. Y., steel for conveyors, 400 tons, to McClintic-Marshall Co.

Factory building, Fifty-second Street and East River, New York, 250 tons, to Oltmer Iron Works.

Telephone building, New Brunswick, N. J., 350 tons, to Hedden Iron Construction Co.

Boston Five Cent Savings Bank, Boston, 1150 tons, to New England Structural Co.

Apartment house, Boston, 240 tons, to Boston Bridge Works.

High school, Newton, Mass., 325 tons, to Boston Bridge Works.

Jamestown Car Parts Mfg. Co., addition, 100 tons, to Kellogg Structural Steel Co.

High school, Akron, N. Y., 100 tons, to Kellogg Structural Steel Company.

Pittsburgh Plate Glass Co., Creighton, Pa., plant extension 5000 tons, to McClintic-Marshall Co., and 500 tons to Pittsburgh Bridge & Iron Co.

Mutual Telephone Co., Erie, Pa., exchange building, 300 tons, to Jones & Laughlin Steel Corporation.

Grade school, Shaker Heights, Ohio, 200 tons, to T. H. Brooks Co.

Bryant Heater & Mfg. Co., Cleveland, factory, 150 tons, to T. H. Brooks Co.

Lincoln-Alliance Bank Building, Rochester, N. Y., 1200 tons, to Genesee Bridge Co.

Elks Club, Buffalo, 700 tons, general contract placed with Charles Everett, Buffalo.

New York Central Railroad, car dumper at Toledo, Ohio, 600 tons, to Wellman-Seaver-Morgan Co.

G. A. Gray Co., Cincinnati, new plant, 500 tons, to Austin Co., Cleveland.

South Dakota State Highway Commission, bridge at Forest City, 1370 tons, to St. Louis Structural Steel Co.

Missouri-Kansas-Texas Railroad, 1925 bridge work, 828 tons, to Wisconsin Bridge & Iron Co.

Morton Salt Co., Hutchinson, Kan., 250 tons, to McClintic-Marshall Co.

Standard Oil Co., Whiting, Ind., 32 stills, 1150 tons, to be built by company's own forces.

Michigan Alkali Co., Wyandotte, Mich., 190 tons, to Rochester Bridge Co.

Montreal Mining Co., Ironwood, Mich., 100 shaft sets, No. 4 shaft, Montreal Mine, Hurley, Wis., 139 tons, to American Bridge Co.

Public school, Charleston, W. Va., 500 tons, to McClintic-Marshall Co.

American Woolen Co., boiler house extension, Lawrence, Mass., 200 tons, to Palmer Steel Co., Springfield, Mass.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Board of Transportation, City of New York, steel for the Narrows Tunnel between Staten Island and Brooklyn, 17,000 tons, letting on May 8.

First National Bank Building, Hoboken, N. J., 200 tons.

State of New Jersey, highway bridge at Red Bank, N. J., 1000 tons.

Parochial school at Howard Beach, Long Island, 200 tons.

First National Bank Building, Tampa, Fla., 400 tons.

Citizens Development Co., building at Elmhurst, Long Island, 400 tons.

Garage and storage building, Springfield, Mass., 250 tons.

Homeopathic Hospital, East Orange, N. J., boiler house, 300 tons.

Boston & Albany Railroad, bridges in Massachusetts, 500 tons.

Rochester Gas & Electric Co., Rochester, N. Y., office building, 900 tons.

Chamber of Commerce Building, Rochester, addition, 700 tons.

College Hill School, Cincinnati, 200 tons.

City of Minneapolis, riveted pipe line, 1500 tons.

Hotel, Oklahoma City, Okla., 1000 tons.

Theater for Lubliner & Trinz, Chicago, 1050 tons.

Union Pacific, bridges over Big Wood River, Idaho, and Mallad River, Utah, 550 tons.

Twelfth Church of Christ Scientist, Grace Street near Sheridan Road, Chicago, 200 tons.

Missouri State Highway Commission, bridges, 526 tons.

RAILROAD EQUIPMENT BUYING

Car Orders Less Than 1000 and Little New Inquiry

Counting the Southern Pacific's plans to build cars in its own shops, orders for new freight cars cover 961. Inquiries total 325. Locomotive business is dragging. The chief items are as follows:

The Missouri Pacific has awarded orders for the repair of 2000 freight cars to the following companies: American Car & Foundry Co., Pennsylvania Car Co., Sheffield Car Co. and the North American Car Co.

The Shippers Car Line has bought 20 second-hand tank cars from the American Car & Foundry Co.

The Stauffer Chemical Co. has bought 1 tank car from the American Car & Foundry Co.

The American Car & Foundry Co. has sold 4 dump cars to P. J. Campion.

The Grasselli Dyestuffs Co. has ordered 1 tank car from the American Car & Foundry Co.

The North Western Mining & Exchange Co. has ordered an additional lot of 50 pit cars from the American Car & Foundry Co.

The Rutland has placed 3 Pacific type locomotives with the American Locomotive Co.

The New York Central has placed 25 baggage cars with the American Car & Foundry Co.

Standard Steel Car Co. and 10 coaches with the Pressed Steel Car Co.

The Standard Oil Co. has placed 15 tank cars with the American Car & Foundry Co.

The Northern Pacific has ordered 10 observation cars from the Pullman Car & Mfg. Corporation.

The Illinois Traction is inquiring for 50 to 100 hopper cars.

The Florida East Coast is inquiring for 15 coaches.

The Nashville, Chattanooga & St. Louis has placed 2 dining cars with the Pullman Car & Mfg. Corporation.

The Richmond, Fredericksburg & Potomac has ordered 6 coaches from an unnamed builder.

The Kansas City, Mexico & Orient has increased its inquiry from 250 to 500 cars as follows: 350 box, 100 stock and 50 automobile cars.

The Southern Pacific will construct in its own shops 500 box and 50 caboose cars for its Pacific system and 300 box and 20 caboose cars for its Texas Lines.

New Youngstown Stack Blown In

The Youngstown Sheet & Tube Co. has completed its second blast furnace at Indiana Harbor, Ind., and blew it in on Tuesday, March 24. The stack is 4000 cu. ft. larger than the furnace of the Trumbull-Cliffs Furnace Co., Warren, Ohio, which holds the world's record of daily production at 1011 tons, and has a monthly record averaging approximately 900 tons per day. The new Youngstown stack is equipped with the largest blower ever built. The Freyn Engineering Co., Chicago, was engineer in charge of the design of the blast furnace plant. As soon as the new furnace gets on a production basis, it is planned to blow out the other Youngstown stack at Indiana Harbor for relining.

The annual convention of the Amalgamated Association of Iron, Steel and Tin Workers will be held in the auditorium of the Eagles Building, 431 Third Avenue, Pittsburgh, starting April 7. This gathering is of interest to sheet, tin plate, and iron bar manufacturers, since at it will be formulated the wage demands to be presented to them at a future conference.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
March 25.....	14.25	13.87½	53.75	8.90	8.60	7.70	7.35
26.....	14.25	13.75	54.25	8.75	8.50	7.67½	7.32½
27.....	14.12½	13.62½	53.25	8.70	8.40	7.57½	7.22½
28.....	14.00	13.50	.....	8.70	8.40	7.50	7.15
30.....	13.75	13.25	52.20	8.45	8.12½	7.40	7.05
31.....	13.75	13.25	52.37½	8.45	8.12½	7.35	7.00

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, March 31.

Lack of demand and lower prices characterize all the markets. Copper has declined to the lowest levels of the year. Despite moderate buying of tin, speculation has forced prices lower. There have been sharp recessions in lead quotations and the zinc market has declined to the lowest level thus far this year.

Copper.—Various reasons are given for the sharp decline in copper, particularly this week, to the lowest value for the year. There has been some speculative selling in this market which, coupled with the weakness in London and the absence of consumer interest here, has weakened the market. Electrolytic copper was available today at 13.50c., delivered, for April and the second quarter, with Lake copper quoted at 13.75c., delivered. There is a strong belief that consumers' stocks are low and that these must be replenished soon. There are already inquiries before the market running into several thousand tons which may be placed as soon as consumers feel that the bottom has been reached. There has been a little more export buying in the last few days, including about 1000 tons, which was purchased at 13.45c., f.a.s. While some producers are somewhat pessimistic, others do not regard the situation unfavorably and look for a turn for the better very soon, with possibly fairly large buying.

Copper Averages.—The average price of Lake copper for the month of March, based on daily quotations in THE IRON AGE, was 14.46c. The average price of electrolytic copper was 14.06c., refinery, or 14.31c., delivered.

Tin.—Importers state that there has been a moderately steady business, the total for the week approximating 1000 tons. The feature has been the absence of consumer buying, dealers, of course, being the active participants. An arrival of 1700 tons on one vessel, all of which went to one importer, is regarded by some as indicating that this metal was quietly sold to some consumers. Yesterday dealers were again active with sales totaling 250 to 300 tons at prices ranging from 52.50c. to 52c. Today again there was good buying, possibly 400 tons, with both dealers and consumers participating, with spot Straits tin quoted at 52.37½c., New York. Sales ranged from 51.87½c. to 52.50c. There have been declines in the London market nearly each day, until today quotations were about £10 per ton less than a week ago, with spot standard quoted at £235 10s., future standard at £239 5s. and spot Straits at £241 10s. The Singapore price yesterday was £243 5s. Deliveries into consumption for March were about 7100 tons, which is larger than was expected. This apparently has made no impression on prices here or in London. Arrivals to March 29, inclusive, have been 7495 tons, with 4700 tons reported afloat.

Lead.—There has been a moderate business in small lots, but buying on a large scale is absent. The leading interest reduced its price twice in the last week, the first time on Thursday, March 26, from 9c. to 8.75c., New York, and the second time yesterday, to 8.50c., New York. Quotations in the outside market are 8.45c., New York, and 8.12½c., St. Louis. One explanation of the weakness is a report that one dealer overstayed the market and is now an active seller. Quotations are now about 2c. per lb. less than the highest level for

the year, which prevailed about the middle of January.

Zinc.—Prime Western zinc is now available at 7c., St. Louis, or 7.35c., New York, the lowest price at which business has been done this year. Consuming demand, however, is almost entirely absent, even at these levels. A few weeks ago, when the metal was available at close to 7.25c., St. Louis, there were some prospective buyers, but today these have vanished even with the metal obtainable ¼c. lower. General weakness in the other markets, both here and abroad, is one cause of the decline.

Nickel.—Shot and ingot nickel in wholesale lots are quoted at 31c. to 32c. per lb., with electrolytic nickel available at 38c.

Antimony.—Wholesale lots of Chinese metal for spot and early delivery are quoted at 14c., New York, duty paid, with March-April shipments from China available at 12.75c. to 13c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, continues to be quoted at 27c. to 28c. per lb., delivered.

Old Metals.—The rapid decline in virgin copper prices has demoralized the old metal market. Trading is difficult because most of the holders will not part with goods at the present low prices. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible.....	13.25
Copper, heavy and wire.....	12.25
Copper, light and bottoms.....	10.50
Heavy, machine composition.....	9.75
Brass, heavy.....	8.25
Brass, light.....	7.00
No. 1 red brass or composition turnings..	9.50
No. 1 yellow rod brass turnings.....	9.00
Lead, heavy.....	7.50
Lead, tea.....	6.25
Zinc.....	4.75
Cast aluminum.....	19.00
Sheet aluminum.....	19.00

Chicago

MARCH 31.—All of the metals have declined and in view of the absence of buying the trade is speculating as to where prices will stop. Old metal prices have also declined rather generally. We quote, in carload lots: Lake copper, 14c.; tin, 53.50c.; lead, 8.15c.; zinc, 7.15c.; in less than carload lots, antimony, 16c. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9c.; red brass, 8c.; yellow brass, 7c.; lead pipe, 6.50c.; zinc, 4c.; pewter, No. 1, 28c.; tin foil, 30c.; block tin, 38c.; all buying prices for less than carload lots.

Slight Increase in Operations in the Mahoning Valley

YOUNGSTOWN, March 31.—Production schedules of Mahoning Valley iron and steel properties show moderate upward tendencies this week in finished steel departments. At the beginning of the week every merchant bar mill in the district, including the independent and Carnegie Steel Co. units, was engaged. Some of the independent mills, however, were not scheduled for a full week's production. The Republic Iron & Steel Co. is operating this week its 14-16 in. mill, as well as all of its light bar mills.

Of the 5 blast furnaces in the Youngstown district, 32 are in blast, no change from the preceding week, but indications point to additional suspensions because a number of stacks are in need of relining.

Steel ingot production is being maintained at an approximate 80 per cent average, sustained by the relatively high rate of the Carnegie company. Of 67 open-hearth furnaces in the district, 49 are in operation, including 32 of the 52 independent units. Bessemer steel output is retarded; the Republic company is operating its Bessemer plant but a single turn, while the Youngstown Sheet & Tube Co. has this department on double turn.

In the tube mill division, 12 of 18 furnaces are on full time, with one on part time. Skelp mill production is close to normal, however, with all units engaged.

Sheet mill schedules show little change from the preceding week, with 87 of 127 mills in the Valley in operation.

PERSONAL

Several changes in the organization of the Otis Steel Co., Cleveland, were made at the annual meeting, March 27. Parker F. Wilson and J. G. Carruthers, the latter sales manager, resigned as directors and were succeeded by Charles L. Bradley and John Sherwin, Jr., both of the Union Trust Co. The company will have two vice-presidents as heretofore, but these hereafter will be designated as first and second vice-presidents. R. H. Clark, vice-president, Midland Steel Products Co., was elected first vice-president and will devote much of his time to management of the company. E. J. Kulas, who was recently elected president of the Otis company, is also president of the Midland Steel Products Co. Mr. Clark as vice-president succeeds D. T. Croxton, of the Cleveland Cliffs Co. Parker F. Wilson who has been one of the vice-presidents becomes second vice-president. H. B. Miller, secretary, tendered his resignation and was succeeded by F. G. Oviatt, who has been assistant secretary.

L. N. McDonald, the new general superintendent at Youngstown of the Carnegie Steel Co., succeeding I. Lamont Hughes, advanced to vice-president, as announced in THE IRON AGE of March 26, originally went to the company's Ohio works in 1902 from the Duquesne plant, to take charge of the Bessemer department. With the installation of open-hearth furnaces at the former plant, his jurisdiction was extended to the open-hearth steel department as well. In June, 1916, he succeeded Mr. Hughes as assistant general superintendent of the Youngstown district, a position he has held ever since, until his recent promotion. A. W. Griffith, appointed assistant general superintendent, went to Youngstown in 1902 from the McCutcheon mills, where he was superintendent, to take charge of the design and installation of the proposed McDonald units. As this project was delayed at the time, he was appointed assistant superintendent of the Upper and Lower Union mills, and in 1916 became superintendent of bar mills in the district. H. J. Baugh, the new superintendent of bar mills for the Carnegie company in the Youngstown district, acted as superintendent of the Upper Union mills from 1906 until 1916, when he was named assistant superintendent of district bar mills. G. R. Bennett, who went to the Union mills at Youngstown in 1907 from Pittsburgh, was appointed master mechanic of bar mills in 1916, and succeeds Mr. Baugh as assistant superintendent of the bar mill division.

G. H. Clamer, past president of the American Foundrymen's Association, and a member of the board of directors, will deliver this year's exchange paper before the meeting of the Association Technique de Fonderie de France. It will be entitled "The Practice Followed in the United States in the Manufacture of Railroad, Car and Locomotive Bearings." Mr. Clamer can speak with authority on this and other non-ferrous subjects because he was the first chemist to be engaged regularly in the field of non-ferrous metallography in this country and has been engaged in research and production work with the Ajax Metal Co., Philadelphia, ever since he was graduated from the University of Pennsylvania in 1897. He was awarded the Elliott-Cresson gold medal, the highest award of the Franklin Institute, Philadelphia, because of his researches in foundry chemistry and metallography.

N. S. Rathburn resigned as secretary and assistant treasurer of the National Acme Co., Cleveland, at the annual meeting on March 26 and was succeeded by O. F. Douglas, formerly assistant secretary. Mr. Rathburn, who had been connected with the company over 20 years, and W. R. Mitchell retired from the board of directors and Amos Burt Thompson was elected, membership being reduced from ten to nine. L. E. Honeywell has resigned as advertising manager of the Acme company, which position he has held for several years.

C. I. Ochs was elected president and general manager of the Eaton Axle & Spring Co. at the annual

meeting, March 26, succeeding J. O. Eaton, who was elected chairman of the board. Mr. Ochs has been with the company and its predecessors since 1916, having been formerly purchasing agent of the Torbensen Axle Co. and general manager of the Eaton Axle Co. Fred C. Robie, formerly a member of the advisory staff of the General Motors Corporation, has become a new member of the organization, being elected vice-president and assistant general manager.

Alfred G. Smith has been elected president of the American Shipbuilding Co., Cleveland, to succeed M. E. Farr, who resigned a few months ago. Mr. Smith has been connected with the company about 20 years and recently has been its vice-president.

Andrew C. Duncan has been appointed district engineer for the Elwell-Parker Electric Co., Cleveland, for the territory contiguous to St. Louis. His address is 2835 Washington Boulevard, St. Louis. J. P. Lyons has been appointed district engineer for this company for Atlanta and surrounding territory. His office is 612 Citizens & Southern Bank Building, Atlanta, Ga.

H. D. Jenkins, Otis Building, 10 South LaSalle Street, Chicago, has been appointed Chicago sales representative of the Baltimore Tube Co., Baltimore, manufacturer of brass, bronze, and copper products, Admiralty and Muntz metal and condenser tubes. Mr. Jenkins is also sales representative at Chicago for the Mahoning Valley Steel Co., Niles, Ohio.

William A. Brecht, formerly general sales manager of J. B. Wise, Inc., manufacturer of plumbing supplies, Watertown, N. Y., has been made vice-president, and William M. Thompson, western sales manager, has been appointed general sales manager. Frank P. Neal, formerly with the Mark Mfg. Co. and the Steel & Tube Co. of America, has been appointed western sales manager with headquarters at the Lytton Building, Chicago.

John H. Beery has been appointed general superintendent of the Bolmer Mfg. Co., Springfield, Ohio, manufacturer of molding machines and appliances. He has been connected with the Kelly-Springfield Printing Co., Springfield, for the past 24 years.

F. J. Reider has been elected president of the Anderson Piston Co., Bowling Green, Ohio, manufacturer of iron pistons for motor cars. H. H. Elwood is the new vice-president and factory manager.

L. W. Grothaus, who has been Cleveland district manager of the Allis-Chalmers Mfg. Co., has been promoted to assistant manager of the electrical department and will make his headquarters at the Bullock works of the company, Norwood, Ohio. A. H. Wyman, who has been district manager at Salt Lake City, has been named to succeed Mr. Grothaus at Cleveland and H. E. Weiss, sales engineer in the Chicago office, goes to Salt Lake City to replace Mr. Wyman. These changes became effective April 1.

Edward R. Anderson, until recently a member of the sales force of the Stocker-Rumely-Wachs Co., Chicago, on April 1 became associated with the Chicago sales organization of the Hendey Machine Co., Torrington, Conn.

Alfred de Fries, manufacturer of special machinery and maker of bolts and nuts, Cassel, Germany, is visiting the United States, with New York address at the McAlpin Hotel, in search of some special leaf spring making machinery and to market some machinery patents he owns.

George J. Hagan, founder and formerly president of the George J. Hagan Co., has disposed of his entire interest in the company, and has opened offices in the Peoples Bank Building, Pittsburgh. He will engage in the design and construction of industrial furnaces which has been his specialty for the past 28 years.

Matt J. Herold has been appointed general manager of sales of the United States Electrical Co., Cincinnati, manufacturer of electrical drills. Mr. Herold has been with the company for a good many years, having started as a road salesman in 1910.

Joseph W. Taft, Elgin, Ill., largest individual stockholder in the American Ironing Machine Co., Algonquin, Ill., has disposed of his interests therein to the Reynolds Electric Co., Chicago. He has been succeeded on the board of directors by William Laib, Chicago, secretary-treasurer of the electric company.

Charles S. Durkee has been appointed western district sales manager of J. H. Williams & Co., Buffalo, manufacturer of drop-forgings and drop-forged tools, in charge of the West and Southwest, with offices and warehouse at 117 North Jefferson Street, Chicago. He has been with the organization for 18 years and during the past two years was in charge of the central sales district with headquarters at Buffalo.

Clifton Taylor, who has been connected with the Molybdenum Corporation of America in various capacities, since its organization, has taken charge of sales and development, succeeding H. H. Davis, resigned.

Fred Burris, Bristol, England, director of the Mustad Horse Nail Co., of Gothenburg, Sweden, and Bristol, is making a tour of the United States and will be in this country until June. He has been identified with the horse nail industry, first as a mill worker and later as a manufacturer, for more than 40 years. His address will be the Pennsylvania Hotel, New York.

George C. Stone and Alfred W. Dodd have been appointed to represent the American Zinc Institute on the Galvanizing Committee of the American Society for Testing Materials.

William H. Ridgway, Craig Ridgway & Son Co., Coatesville, Pa., will spend the greater part of June in Great Britain, sailing from New York late in May on the Leviathan.

W. J. Kenealy has withdrawn from the practice of law at Youngstown, Ohio, to become actively associated as vice-president with the Atomized Fuel Industries, 120 Broadway, New York. A. H. Ballard of the Ballard Oil Co., New York, is president of the company, which operates a plant at Evansville, Ind.

Charles A. Gross has retired from the Fagan Iron Works, Jersey City, N. J., and has become associated with Lewis D. Rights, contracting manager at 256 Broadway, New York, for the Shoemaker Bridge Co. Mr. Gross was formerly identified with the Bethlehem Steel Co. and later with the Harris Structural Steel Co., New York.

Robert R. Cuthbertson, formerly manager Chicago branch of Manning, Maxwell & Moore, Inc., and for 25 years identified with that organization, has resigned. Mr. Cuthbertson is a past president of the Machinery Club of Chicago.

OBITUARY

John H. Conlen

JOHN H. CONLEN, chief engineer Bradlee & Co.'s Empire Chain Works, Philadelphia, died March 8. He was born in Ireland nearly 84 years ago and came to this country at the age of seven. He received elementary schooling only, because of the necessity of earning his living, and through many vicissitudes of early life learned his trade as machinist and engineer in Newark, Brooklyn and Chicago. After serving for a time as an engineer for a paper mill in Manayunk, he entered the employ of the Empire Chain Works as chief engineer and held that position until his death.

Dr. Arthur H. Gerhard, vice-president of the company, in a letter to THE IRON AGE pays this tribute to the deceased:

"Mr. Conlen was a remarkable man who could do anything in his line of work from simple carpentry and pattern making to the most intricate engineering problems. If he had had the advantages of early technical education, he would have been one of the foremost engineers of the country. He served faithfully in one position for 42 years, until Saturday, March 7, the day before he died. He was one of the noblest, simplest characters imaginable. His sense of duty was always foremost. He had many sorrows and privations which were invariably overcome by his kindness and ever abiding sense of humor. He was singularly retiring in his private life, wishing no company save that of his family and a few devoted friends. The quietude and simplicity of his life, his integrity, his ideals, his patience, loyalty and affection served as an example to friends and acquaintances who were privileged to know him."

HARRY B. DUNCAN, president Universal Steel Co., Bridgeville, Pa., died at his home in Washington, Pa., March 27. He also was president of the Duncan-Miller Glass Co., Washington, Pa., and was an active figure in the business circles of that district, having been president of the Washington Chamber of Commerce. He was a veteran of the Spanish-American war. He was born in Pittsburgh, April 19, 1863.

JOHN A. MCGREGOR, president Union Twist Drill Co. Athol, Mass., since its organization 20 years ago, died at his home there on March 26. He was in his sixty-eighth year. Mr. McGregor was a native of Nova Scotia, and served his apprenticeship with the Brown

& Sharpe Mfg. Co. He rose to assistant superintendent, leaving in 1893 to become vice-president of Edwin Harrington & Co., Philadelphia. He remained there two years, then resigned to become general superintendent with the Morse Twist Drill & Machine Co., New Bedford, Mass., which after 10 years he left to become president of the newly formed Union Twist Drill Co. During the war he was also president of the Hopkins & Allen Arms Co., Norwich, Conn., manufacturing rifles for the Belgian Government. Mr. McGregor leaves his wife, three daughters, and two brothers, Hugh R. McGregor, superintendent Brown & Sharpe Mfg. Co., in Providence, and James McGregor, a builder, of the same city.

JOHN LUTHER NICHOLSON, president Locomotive Fire Box Co., Chicago, died at his home in that city March 23, following a short illness with pneumonia.

WARNER M. LEEDS, brother of William B. Leeds, with whom he was associated in the American Tin Plate Co., Elwood, Ind., about 30 years ago, died on March 25 at his home, 11 East Sixty-fifth Street, New York. Mr. Leeds was born in Richmond, Ind., in 1868, was graduated from the University of Minnesota, and after making a tour of Europe, returned to join his brother as an executive of the tin plate company, removing to the New York headquarters of the company in 1900. The late Daniel G. Reid and William R. Graham were associated in the Elwood company before it was taken over by the United States Steel Corporation.

WALTER P. FRENCH, treasurer E. J. Lavino & Co., the Lavino Furnace Co., the Lavino Shipping Co. and the Lavino Refractories Co., all with offices in the Bullitt Building, Philadelphia, died on March 24 of pneumonia. He had been ill only two days. Mr. French was 49 years old. He leaves his wife, father and mother, two sisters and a brother.

HERBERT AUSTIN, for many years associated with Austin & Doten, Boston, iron and steel merchants, died Sunday, March 22, at a local hospital following a long illness. He was born in Honolulu in 1859. His early education was obtained in Boston and he entered Harvard in the class of 1881, but left at the close of his freshman year to become associated with F. D. Austin & Co., Boston, wholesale iron dealer. In 1886 he was admitted to the firm of Austin & Doten and was associated with that firm for 39 years.

EDWARD T. RUTLEY, 50 years old, secretary and general manager of the Cambridge Tile Mfg. Co., Covington, Ky., died at the home of his sister in Covington after an illness of three weeks. Mr. Rutley became ill when on a business trip to Chicago.

Metallurgical Research in England

(Continued from page 978)

the basis of knowledge of this kind it has become possible to formulate a theory of the inner structure of alloys which has already furnished a simple and unifying explanation of whole masses of formerly unrelated facts and even the successful prediction of groups of new facts about alloys, with the result that we are now in a fair way to gain a much deeper and truer insight into the underlying causes of the general behavior of metals and alloys than would have been thought attainable 10 years ago. Accordingly, X-ray analysis of metal and alloy crystal structure has become an important feature of the work of the metallurgy department at Teddington. This work is carried out in conjunction with the physics department of the N. P. L. and important result on various alloy systems, among which those of copper-aluminum and copper-zinc may be mentioned, have been obtained—both these systems showing a striking confirmation of theoretical predictions made by the writer.

Work of this type illustrates one of the great advantages for research purposes of such an institution as the N. P. L. where splendidly equipped and staffed departments working on other branches of physical science are available close at hand for consultation or cooperation. Thus work in the metallurgy department is constantly carried on for or in conjunction with the engineering department in the investigation of the mechanical properties of materials and in the study of interesting cases of failure or breakage, while—in an entirely different direction—there is cooperation with the heat department in regard to the standardization of pyrometers, and with the electrical department in regard to such matters as alloys for high-resistance wires and steels for magnetic uses.

(To be concluded)

Weakness in Sheets Attributed to Policy of Automobile Manufacturers

YOUNGSTOWN, March 31.—Somewhat more business is developing in finished steel lines which have heretofore displayed irregularity, such as steel sheets, say sales executives. The market, however, lacks the sustaining influences and backlog essential to stability. Much of the blame for current weakness in sheets is laid at the door of automobile interests in Detroit, where most vigorous efforts have been made to break down quotations.

Producers likewise attribute price instability to a weak sales policy on the part of smaller interests, but contend that the buying policy of the motor industry is the principal factor. The smaller, non-integrated producers have endeavored to reduce overhead costs per ton of output by maintaining production as close to capacity as possible. To do this, it has been necessary for them to cut below the market, and they figure that price concessions have been offset in part by saving in overhead charges per ton of production.

There is confidence in this district, though, that prices will stabilize around current levels in finished steel lines. Lower prices are not so serious, in view of lower coal and coke costs, making for lower iron and steel production charges.

Will Dismantle Atlantic Stack

The Republic Iron & Steel Co., Youngstown, has decided to dismantle its Atlantic furnace, New Castle, Pa., and to sell the real estate. The stack was erected in 1868 and operated by Peter Kimberley, but has since been rebuilt several times, the last time in 1913. It is rated as a 350-ton unit and was last operated in 1917. Another of the company's furnaces, the Hannah furnace, located in the Smoky Hollow section of Youngstown, with about the same capacity as the Atlantic furnace, it is reported, also is to be dismantled. This furnace was built in 1880.

PENALTY FOR DUMPING

Clear Case Must Be Made According to Law—Keen Interest in Inquiry

WASHINGTON, March 31.—Imports of pig iron in February having amounted to 47,803 gross tons, the largest incoming movement of the kind since March, 1923, when the total was 72,344 tons, interest in the anti-dumping inquiry relating to shipments from India has increased. Pig iron imports from India in February were 17,628 tons, an increase of 2108 tons over those of January. While the figures of the Bureau of Foreign and Domestic Commerce give the invoice value of all incoming shipments, and those relating to Indian iron are understood to be c.i.f. port of origin, the trade is awaiting action by the anti-dumping unit in New York before reaching conclusions as to the "home market value" as outlined in the anti-dumping act. The interpretation of this term by the customs officials is considered to be vitally important as it bears on the question of recommending penalty or no penalty by reason of shipments of iron received from India. The particular shipments concern receipts at Galveston.

The act itself provides several means of arriving at the "home market value." Under Section 205, the foreign market value is defined as the price at time of exportation of the commodity being dealt with, "at which such or similar merchandise is sold or freely offered for sale to all purchasers in the principal markets of the country from which exported, in the usual wholesale quantities and in the ordinary course of trade for home consumption (or, if not sold or offered for sale for home consumption then for exportation to countries other than the United States)," plus certain incidental costs when the latter are included in the price. The phraseology of the definition is taken to mean that if Indian iron producers actually in good faith offered iron for sale, even if no transaction was made, in the home market at the price at which sales were made in the United States or other countries, there would exist no reason for assessing a penalty under the anti-dumping act. It has been interpreted that sales in small lots could have been made at one price in India while offers for sale in wholesale quantities could have been made there at lower figures, even if there were no large sales made, and the latter figure would establish the home market value. The act says, however, that "in the ascertainment of foreign market value for the purposes of this title, no pretended sale or offer for sale, and no sale or offer for sale intended to establish a fictitious market, shall be taken into account."

It is assumed that the report of the American consulate takes up all these questions and that it may establish a basis for considering what constitutes wholesale quantities that might quite conceivably be different than would exist in the United States. In the absence of being able to arrive at a foreign market value by sales or offers in the home market as defined in the act, two other principal methods of basing calculations for the purpose of the act are provided, one being on the cost of production, and the other on the exporter's sale price, both of which are defined.

These questions, it is believed, will have an important part in the proceeding along with the report that the anti-dumping unit will get from the domestic producers as to whether their industry is being injured and their reason for their views.

Tata Iron & Steel Co. Operations

The statement was made in the London correspondence of THE IRON AGE some weeks ago that the Tata Iron & Steel Co., Ltd., Bombay, India, was closing down portions of its steel plant at Jamshedpur. The company advises THE IRON AGE that this statement is in error; that it has not been curtailing output, but on the other hand has increased production in every department, with corresponding reduction in cost of manufacture.

Iron and Steel Imports Close to Exports

Exports Lowest in 3½ Years, While Imports Are Highest in 2 Years—Heavy Pig Iron Purchases Responsible

WASHINGTON, March 28.—With an excess of only 9292 gross tons more than imports, shipments of iron and steel abroad in February, 1925, amounted to but 101,665 tons, valued at \$14,513,722, compared with imports of 92,373 tons, valued at \$2,830,407. The near-balance between exports and imports was most unusual. While the exports were the lowest since September, 1921, the imports were the highest since March, 1923, when the latter totaled 106,197 tons. This turn in the foreign iron and steel trade is the source of activity among domestic producers of both pig iron and

imports over those of January not only in pig iron but also in ferromanganese, scrap, semi-finished material, bar iron and tubular products. In most of the other finished lines there were declines under January, when imports totaled 77,058 tons, or 15,315 tons less than in February. The greatest increase in imports was in pig iron, which amounted to 47,803 tons (more than half the total), the largest monthly import move-

Sources of American Imports of Iron Ore
(In Gross Tons)

	February		Eight Months Ended February	
	1925	1924	1925	1924
Chile	143,400	40,000	849,275	456,100
Canada	149	112	3,357	11,369
Cuba	32,640	35,614	181,688	410,342
French Africa	20,400	12,720	146,889	247,868
Spain	21,925	10,823	80,086	93,065
Sweden	6,918	13,901	248,309	368,328
Other countries	1,040	1,809	17,653	77,505
Total	226,472	115,039	1,527,257	1,669,577

steel products, merchant furnace operators in the East having brought about anti-dumping proceedings while some steel interests have organized and are complaining against incoming shipments of certain finished steel lines, such as shapes and tubular products.

While the comparatively large imports of February were due to heavy pig iron receipts from abroad, as in previous months, there were increases in February

Exports of Iron and Steel from the United States
(In Gross Tons)

	February		Eight Months Ended February	
	1925	1924	1925	1924
Pig iron	1,413	4,773	21,071	26,058
Ferromanganese	838	2	2,151	2,086
Scrap	2,659	10,378	32,433	63,687
Ingots, blooms, billets, sheet bar, skip	6,361	7,898	65,570	61,079
Wire rods	1,155	3,565	11,472	32,029
Iron bars	287	813	2,431	4,872
Steel bars	9,189	8,938	58,636	92,667
Alloy steel bars	155	198	1,575	1,677
Plates, iron and steel	6,305	8,656	43,755	65,282
Sheets, galvanized	15,640	6,227	100,040	65,856
Sheets, black steel	3,574	8,080	77,925	141,194
Sheets, black iron	1,044	564	7,474	8,984
Hoops, bands, strip steel	3,076	3,722	19,618	24,087
Tin plate,terne plate, etc.	8,051	21,853	90,128	119,485
Structural shapes, plain material	7,129	4,809	69,414	68,612
Structural material, fabricated	5,146	5,144	44,532	57,186
Steel rails	2,453	27,502	117,911	210,211
Rail fastenings, switches, frogs, etc.	1,080	3,735	18,994	31,385
Boiler tubes, welded pipe and fittings	11,963	19,638	117,927	148,641
Cast iron pipe and fittings	1,798	2,290	18,182	19,639
Plain wire	2,637	8,740	18,181	54,993
Barbed wire and woven wire fencing	4,201	5,493	58,421	44,939
Wire cloth and screening	88	87	884	1,520
Wire rope	405	261	2,942	3,322
Wire nails	600	1,382	6,747	42,329
All other nails and tacks	758	605	5,550	5,194
Horseshoes	71	176	567	721
Bolts, nuts, rivets and washers, except track car wheels and axles	906	1,209	11,453	11,931
Iron castings	1,109	1,017	14,243	14,762
Steel castings	920	909	5,628	6,770
Forgings	481	876	3,295	3,851
Total	101,665	164,500	1,050,070	1,435,833

Imports of Iron and Steel Into the United States
(In Gross Tons)

	February		Eight Months Ended February	
	1925	1924	1925	1924
Pig iron	47,803	15,482	184,180	99,707
Ferromanganese*	10,343	2,908	46,126	46,656
Ferrosilicon	655	1,939	5,795	7,440
Scrap	14,502	5,207	66,801	56,181
Steel ingots, blooms, billets, slabs and steel bars†	4,906	3,748	32,931	30,797
Steel bars†	2,863	...	5,398	...
Bar iron	815	314	3,456	4,150
Rails and splice bars	1,930	4,741	27,772	20,594
Structural shapes	4,008	1,005	33,103	9,041
Boiler and other plates	23	521	761	2,567
Sheets and saw plates	60	198	1,969	2,333
Tubular products	2,824	4,323	25,407	7,185
Castings and forgings	231	301	1,585	1,733
Nails and screws	12	26	275	388
Tinplate	46	65	332	736
Bolts, nuts, rivets and washers	10	19	92	118
Wire rods	780	647	3,513	3,910
Round iron and steel wire	273	402	1,726	2,328
Flat wire and strip steel	94	274	1,107	1,314
Wire rope and insulated wire, all kinds	193	90	5,328	649
Total	92,373	42,269	435,571	287,746
Manganese ore*	9,666	4,480	119,586	188,171
Iron ore	226,472	115,039	1,527,257	1,669,577
Magnetite	11,293	7,844	31,787	30,597

*Manganese content only, except ore imports from Cuba, which are admitted free and reported in gross tons of total weight. Shipments from Cuba were: February, 1924, none; February, 1925, 216; 8 months ended February 29, 1924, 9142; 8 months ended February 28, 1925, 12,816 tons.

†Beginning January, 1925, steel bars are reported separately.

ment of pig iron since March, 1923, when the total was 72,344 tons. Pig iron imports in January were 41,344 tons.

The drop in exports in February was accounted for

Imports of Iron and Steel in Gross Tons
(By Months and Monthly Averages)

	Total Imports	Pig Iron	Ferroalloys	Manganese Ore and Oxide*
1909 to 1913, incl.	26,505	14,132	...	...
1914 to 1918, incl.	23,351	4,645	...	247,185
1919 to 1921, incl.	23,901	5,708	3,710	37,115
1922	59,545	31,954	9,117	31,204
1923	61,217	30,653	8,343	17,171
January, 1924	26,675	10,587	2,033	23,081
February	42,269	15,482	4,847	4,430
March	39,278	16,919	2,941	46,047
April	50,969	17,171	7,371	39,728
May	66,801	25,220	5,801	31,992
June	60,569	28,697	2,347	24,726
Fiscal year average	42,115	15,643	6,105	23,307
July	30,410	13,511	1,435	12,287
August	44,928	16,189	1,120	16,160
September	45,214	16,347	3,578	6,269
October	40,873	10,983	8,608	12,088
November	25,707	9,880	7,594	19,919
December	69,281	28,143	10,530	28,305
Twelve months' average	46,370	17,426	4,992	21,672
January, 1925	77,058	41,344	7,165	15,498
February	92,373	47,803	10,997	9,666
Eight months' average	54,446	23,023	6,365	14,950

*Not included in "Total imports." Since Sept. 21, 1922, these figures are for manganese contents of the ore.

†Includes ferroalloys.

‡Average for three years, 1916 to 1918 only.

Exports of Iron and Steel in Gross Tons

	All Iron and Steel	Pig Iron	Semi- Finished Material
*Average, 1912 to 1914...	2,406,218	221,582	145,720
*Average, 1915 to 1918...	5,295,383	438,462	1,468,026
Calendar year 1919.....	4,239,837	309,682	258,907
Fiscal year 1920.....	4,212,732	248,126	288,766
Calendar year 1920.....	4,961,851	217,958	216,873
Fiscal year 1921.....	4,168,619	129,541	82,549
Calendar year 1921.....	2,213,042	28,305	10,363
Fiscal year 1922.....	1,721,418	28,330	63,127
Calendar year 1922.....	1,986,297	30,922	107,201
Fiscal year 1923.....	1,816,329	31,891	137,757
Calendar year 1923.....	1,992,595	32,318	152,748
January, 1924.....	247,942	3,812	8,594
February.....	164,820	4,773	11,463
March.....	123,618	4,047	2,278
April.....	131,276	4,117	8,275
May.....	154,136	4,817	4,895
June.....	163,770	2,057	11,178
Fiscal year 1924.....	2,009,343	40,596	119,744
July.....	137,481	1,796	10,363
August.....	134,628	4,365	6,127
September.....	135,979	4,799	15,473
October.....	157,071	3,373	15,569
November.....	123,577	1,478	8,649
December.....	128,865	2,549	7,081
Calendar year 1924.....	1,792,421	41,478	114,417
January, 1925.....	140,802	1,298	5,764
February.....	101,665	1,413	7,516
Eight months.....	1,050,070	21,071	79,452

*Calendar years.

by the marked decline in shipments of galvanized sheets, tin plate, steel rails, and boiler tubes and welded pipe. Where gains were made they were only slight. Exports in January amounted to 140,802 tons, or 39,137 tons more than in February. Amounting to 11,963 tons, the largest items of export in February were boiler tubes and pipe. Of exports of pipe in that month, Mexico took 4868 tons of casing and oil line, 284 tons of welded black and 129 tons of welded galvanized material.

British India supplied 17,628 tons of the February pig iron imports of 47,803 tons and for the eight months ended with February pig iron imports from that country were 82,974 tons out of a total of 184,180 tons. Philadelphia has been by far the most important port of receipt of pig iron from abroad. Receipts at that port in February were 27,717 tons and for the eight months they were 86,965 tons. Of the Philadelphia receipts in February, 11,229 tons came from India.

United States Imports of Pig Iron by Customs Districts of Entry

	February, 1925	Eight Months Ended February, 1925	Per Cent of Total
Philadelphia.....	27,717	86,965	47.2
Massachusetts.....	12,519	30,228	16.4
New York.....	2,998	24,448	13.3
Galveston.....	2,036	4,696	2.5
Michigan.....	1,863	2,889	1.6
Los Angeles.....	353	9,508	5.2
Other Districts.....	317	25,446	13.8
Total.....	47,803	184,180	

United States Imports of Pig Iron by Countries of Shipment

	February, 1925	Eight Months Ended February, 1925	Per Cent of Total
British India.....	17,628	82,974	45.0
Netherlands.....	9,944	20,996	11.4
Germany.....	9,598	23,250	12.6
England and Scotland..	7,290	37,513	20.4
Canada.....	1,863	3,800	2.1
Belgium.....	1,065	3,288	1.8
France.....	98	10,142	5.5
Other Countries.....	317	2,217	1.2
Total.....	47,803	184,180	

The diagram on page 739, THE IRON AGE, March 5, shows graphically the 7-month movement of pig iron imports, by country of shipment and port of entry.

Dutiable imports of manganese ore (manganese content only) in February amounted to 9450 tons, of which 7989 tons came from India; 1426 tons came from India and 35 tons from Canada. Of structural shape imports in February, amounting to 4008 tons, the chief source of origin was Belgium, which supplied 3499 tons, while France supplied 242 tons and 147 tons and 112 tons were credited to Switzerland and the Netherlands, respectively. Imports of cast iron pipe from France in February amounted to 1230 tons, while those from Belgium amounted to 605 tons.

Imports of iron ore in February rose to 226,472 tons, compared with 174,398 tons in January. Of the February imports of iron ore, 143,400 tons came from Chile, which country supplied 849,275 tons in eight months, or 55.6 per cent of the 1,527,257-ton total.

GERMAN IRON AND STEEL TRADE

1924 Exports Greater Than in 1923—Imports Markedly Less

BERLIN, GERMANY, March 7.—Compared with 1923 the German foreign trade in iron goods shows a remarkable change. Imports decreased from 1,933,260 metric tons to 1,324,011 tons, while exports increased from 1,708,969 tons to 1,955,110 tons. Imports and exports of pig iron both decreased, the former from 300,679 tons to 260,335 tons and the latter from 79,034 tons to 56,286 tons. Imports of girders dropped from 77,341 tons to 44,656 tons and exports from 24,947 tons to 21,190 tons. Bar iron, structural shapes and sheets imported decreased, while exports were higher. Of sheets up to 1 mm. (No. 25½ gage) 16,975 tons were imported last year compared with 44,909 tons during 1923, exports being 28,979 tons and 13,138 tons respectively. The value of the iron and iron goods exports increased from 707,670,000 marks to 792,921,000 marks, and imports decreased from 359,728,000 to 227,779,000 marks.

Exports of machinery, electrical manufactures and carriages were about the same during the two years, with 484,883 tons during 1923 and 481,962 tons during 1924. Imports decreased, however, from 304,381 tons to 190,565 tons, but the value shows the remarkable increase from 47,709,000 marks to 120,959,000 marks, while the value of exports increased only from 816,

675,000 to 841,373,000 marks. The increase in the value of the imports of carriages is largely due to motor cars, of which 4827 were imported during 1924 against 1169 during 1923; exports decreased from 4358 cars to 1516. Foreign trade in motor bicycles shows the same development, 1606 being imported against 256 during 1923 and 2178 exported against 8265.

Imports and Exports of German Iron and Steel Manufactures and Ores During 1924

	Imports (In Metric Tons)	Exports
Iron ore, manganese ore, slag..	3,314,601	290,154
Iron and steel goods, total of which:	1,324,011	1,955,110
Pig iron.....	260,335	56,286
Iron alloys.....	3,562	10,944
Iron scrap.....	44,095	396,638
Tubes, pipes, etc.....	40,496	122,666
Machine parts.....	2,453	1,797
Other iron goods, fine castings, fittings, stoves, etc...	3,561	74,194
Ingots, blooms, billets, etc...	161,699	46,507
Bar iron, girders, structural shapes.....	479,032	242,906
Black sheets.....	96,271	200,837
Tin plate.....	16,867	3,446
Galvanized sheets.....	1,070	12,782
Corrugated sheets.....	130	2,655
Other sheets.....	3,414	3,121
Wire, rolled and drawn.....	49,626	174,795
Rails and track supplies, buffers, rolling stock fittings, etc.....	204,047	99,368
Railroad axles, wheels, etc...	5,277	21,523
Malleable castings, forgings, parts of machinery.....	9,887	90,281

Distribution of American Steel Exports

Japan Took 109,949 Tons and Canada 171,122 Tons of
Nine Leading Items in Eight Months
—Cuba and Argentina Next

WASHINGTON, March 28.—Canada was the leading purchaser of steel products in the eight months ended Feb. 28, having taken 171,122 tons of nine leading products, or 27 per cent of the total of 634,411 tons of those products exported. This total for the nine, in turn, was 67 per cent of all rolled iron and steel exported. Japan, in second position, took 109,949 tons of the nine products, or 17.3 per cent. Cuba bought 65,246 tons; Argentina, 50,226 tons; Brazil, 25,138 tons; Mexico, 16,103 tons, and Philippine Islands, 15,607 tons.

Canada continues to take heavy tonnages of steel plates from the United States, more than 85 per cent of the February shipments going to our northern neighbor. For the eight months Canada took about 80 per cent of the total, with no other country exceeding 2 per cent.

In galvanized sheets Argentina still is the largest buyer, shipments to that country, in connection with the war against the locust plague, accounting for the fact that Argentina took almost half of the total February tonnage and nearly 39 per cent of the tonnage sent out in eight months. The Philippine Islands and Canada stood in second and third positions in February, while Canada, Philippines, Cuba and Japan, in the eight months, all took sizeable tonnages.

Canada took nearly 75 per cent of the black steel sheets shipped in February, but only 25 per cent of the total in eight months, in which period Japan took more

than two-thirds of all the tonnage shipped. Except for these two countries, the distribution was in small quantities.

Distribution of steel rails in February was scattered, no country receiving more than about 700 tons. For the eight months, however, Cuba took more than 30 per cent of the total, with 35,705 tons. Aside from Cuba, the distribution was scattered, Canada receiving 8392 tons, Brazil, Colombia and Japan all between 4300 and 4700 tons, and other countries smaller amounts. This was a complete turnover compared with the eight months of the preceding year, when Japan took 79,000 tons, Canada 44,000 tons and Cuba 29,618 tons, Japan being in first position in place of fifth position this year and Cuba in third in place of first.

Barbed wire, as usual, was widely scattered, no country receiving more than 700 tons of the 4201 tons shipped in February. For the eight months, however, Brazil, with 19,035 tons, or 32 per cent of the total, was far above any other market, Colombia in second position taking only 4045 tons. Argentina was third, with Canada fourth.

Plain and galvanized wire was widely scattered in February, except that Canada, with 1656 tons, took more than 60 per cent of the total. For the eight months Canada was the largest purchaser, taking 32 per cent of all, with Mexico in second position and Australia, Brazil and Cuba following in that order.

Tin plate was shipped in February more largely to

Exports from United States by Countries of Destination
(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924
Total exports....	6,305	8,656	43,755	65,282	15,640	6,227	100,040	65,856	3,574	8,080	77,925	141,194
Canada	5,521	6,806	34,715	48,051	1,965	1,529	9,719	90,961	3,007	4,149	19,367	23,986
Japan	1	59	395	911	2	464	7,610	13,371	603	2,169	52,121	107,367
Cuba	6	29	677	476	732	571	8,318	6,608	51	59	434	1,146
Philippine Islands..	....	17	848	518	2,476	903	9,015	6,543	9	18	454	329
Mexico	69	124	511	524	407	178	4,414	3,609	27	....	313	....
Argentina .....	....	....	....	....	7,574	527	38,481	3,997	17	56	579	772
Chile .....	....	....	....	....	126	55	1,065	1,603	....	....	....	....
Colombia .....	....	....	....	....	309	164	4,048	1,767	....	....	....	....
Central America...	....	....	....	....	496	137	3,166	2,635	....	....	....	....

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924
Total exports....	2,453	27,502	117,911	210,211	4,201	5,493	58,421	44,939	3,637	3,740	16,181	54,993
Canada	277	965	8,392	43,911	267	8	4,100	1,961	1,656	1,207	5,805	9,399
Japan .....	....	10,632	4,378	78,956	....	....	....	....	....	221	518	15,787
Cuba	253	1,847	35,705	29,618	213	392	213	5,476	158	116	1,108	1,560
Philippine Islands..	94	191	3,484	3,432	124	....	1,758	....	6	....	48	....
Mexico	178	4,201	2,454	5,428	469	64	3,460	2,674	196	42	2,436	2,324
Argentina .....	....	....	....	....	591	1,489	4,579	5,545	61	528	448	6,302
Chile .....	....	6,231	2,448	9,162	....	....	....	....	3	45	56	1,367
Colombia	271	73	4,657	2,350	184	398	4,945	2,622	46	....	169	....
Brazil	153	245	4,661	5,422	591	1,401	19,035	9,099	123	474	1,442	6,916
Chosen .....	....	30	....	....	....	....	....	....	....	....	....	....
Honduras	684	661	1,709	2,562	....	....	....	....	....	....	....	....
Kwan Tung .....	....	2,021	....	12,594	....	....	....	....	....	....	....	....
Australia .....	....	....	....	....	193	332	1,861	2,907	120	352	1,006	2,461
British S. Africa...	....	....	....	....	607	165	3,447	3,029	....	....	....	....

	Tin Plate				Plain Heavy Structural Material				Steel Bars			
	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924	February 1925	February 1924	Eight Months Ended February 1925	Eight Months Ended February 1924
Total exports....	3,051	21,853	90,128	119,485	7,129	4,809	69,414	68,612	9,189	3,938	58,636	92,607
Canada	2,602	2,309	14,134	19,726	1,302	....	49,460	....	5,196	....	24,930	....
Japan	226	4,585	41,263	33,789	22	....	2,229	....	44	....	1,435	....
Cuba	76	222	3,432	3,290	246	....	7,979	....	269	....	7,380	....
Mexico	341	540	2,515	1,983	....	....	....	....	....	....	....	....
Argentina	949	1,619	6,129	9,320	....	....	....	....	....	....	....	....
Chile	92	29	2,485	1,840	2	....	2,957	....	....	....	....	....
China	46	4,805	2,059	17,395	....	....	....	....	....	....	....	....
British India	1,561	4,040	3,057	....	....	....	....	....	....	....	....	....
Hong Kong	226	1,987	467	4,744	....	....	....	....	....	....	....	....
United Kingdom...	....	....	....	....	....	....	....	....	2,336	....	9,986	....

Canada and to British India than to any other markets, these two accounting for more than half of the total. No other country received as much as 1000 tons. This is in sharp contrast with February, 1924, when six countries received more than 1600 tons in each case, three of them more than 4000 tons. For the eight months Japan was the largest purchaser, taking more than 45 per cent of the 90,128 tons shipped. Canada in second position took scarcely more than one-third the Japanese purchases. Argentina was third, with less than half the Canadian tonnage.

In steel bars Canada took more than half, with 5196

tons out of 9189 tons. The United Kingdom of Great Britain and Ireland was in second position, with more than one-fourth the total. For the eight months Canada and England were in first and second positions, with Cuba, taking about 13 per cent of the total, in third place.

Plain structural material shipped abroad in February was well scattered. Canada, the largest purchaser, took less than 20 per cent of the total. This was not the case in the eight-month period, however, for Canada's 49,460 tons accounted for more than 70 per cent of the total, with Cuba in second position.

FRENCH MARKET NOT ACTIVE

Prices Firm Because Thought to Be at Bottom— Heavy Freight Rate Increase

PARIS, FRANCE, March 20.—A slight tendency for the better having been noticed in Belgium, it was easy for some to think the same had happened in France. This is not the opinion of those whose duty it is to watch the market's smallest pulse-rate; nevertheless the firm prices in pig iron, semi-finished products and some of the rolled steels leave no hope to consumers of getting further concessions. Orders seem disposed to be forthcoming, the more so that the needs—considerable, most certainly, for customers have for months applied a hand-to-mouth policy—must be covered by the beginning of spring. For a few days inquiries have been numerous; it is hoped they connote future orders.

Industry, unfortunately, will again be affected by an increase of railroad rates, to be applied from March 16 on. Producers had risen against the abusive increase of additional expenses, fixed expenses hitting in consequence at the same time and at the same rate small and big shipments alike. That there should not appear any loss in their return estimates, the railroad companies now have been allowed to increase their rates by a large amount, which is a terrible burden for producers and business people alike.

As the price of bread continues to rise, and as, far from decreasing, the cost of living is going up every day, it is more than probable that demands for increases of wages will take place. This will in no way render more easy the adjustment of sales prices to the habitual conditions of the market. For export, where business is most calm, the tendency is to the better and prices are slightly firmer.

Coke.—For the first 16 days of March the ORCA received from the Ruhr 194,511 tons of coke, or a daily mean of 12,160 tons.

Pig Iron.—Market continues firm. Tonnage available is rare and delay for delivery becomes longer and longer. Basis price for March remains unchanged at 335 fr. (\$17.67 per gross ton) for 100-ton lots and less, with a decrease of 5 fr. per ton from 100 to 199 tons; of 10 fr. (53c.) from 200 to 999 tons; of 12 fr. per ton for 1000 tons and more. After April 1 the basis price for pig iron No. 3 PL is fixed at 345 fr. (\$18.20) due to an increase in the rate for coke. The producers' entente is studying a new classification for raw pig iron, based on its chemical composition, but meantime it is the former classification, that of the Comptoir de Longwy, that holds, and foresees, on the basis price of No. 3 PL, the following decrease and increase rates:

Decrease		Increase	
No. 4 PL	..... 3 fr.	No. 1 PL	..... 5 fr.
No. 5 PL	..... 6 fr.		
No. 3 PR	..... 5 fr.		
No. 4 PR	..... 10 fr.		
No. 5	..... 15 fr.		

Users hope that this is to be the last increase, at least for some time. It seems impossible that, at present, the French market should be able to uphold a higher price than that at which it will have to order at the beginning of next month. Export business remains the same, though favored by exchange. F.o.b. Antwerp, Belgium, Luxemburg and Lorraine quote very nearly the same prices; that is: 350 to 355 fr. Belgian currency (\$18 to \$18.25) for No. 3 or £3 18s. to £3 19s.

Hematite iron remains unchanged; the average in the East is 430 fr. (\$22.68) per ton, at works; 410 to 420 fr. (\$21.63 to \$22.15) at works Center.

Semi-Finished Products.—Demand is slightly better; available product is limited. The prices of the entente are well upheld inland: Blooms: 420 fr. (\$22.15) per ton for 115 to 150 mm. (4½ to 6 in. thick); 415 fr. for 150 mm. and more; brames, 430 fr. (\$22.68); billets, 70 mm. (2¾ in.) or more, 440 fr. (\$23.20) per ton; those of less than 70 mm., 450 fr. (\$23.74); largets of 200 mm. (7¾ in.) or more on 13 mm. (½ in.) and more, 460 fr. (\$24.26); less than 200 mm. and less than 13 mm., increased rate, for both cases, by 20 fr. per ton (\$1.05). For export prices show a noted tendency to rise; quotations f.o.b. Antwerp per gross ton are: Blooms, £5 to £5 2s. 6d. (\$23.90 to \$24.50); billets, £5 4s. to £5 5s. (\$24.85 to \$25.10); largets, £5 7s. to £5 8s. 6d. (\$25.57 to \$25.92); open-hearth steel billets, £5 12s. 6d. (\$26.90), f.o.b. Antwerp.

Rolled Steels.—Activity is greater; many inquiries as to prices forecast a rally within a short period, should no untoward incident intervene. Prices of the entente are not changed for inland; basis for concrete bars is established at 520 fr. (1.22c. per lb.) for 12 mm. (0.47 in.) and more; for inferior sizes, increased rates are 10 fr. (53c.) per ton for 9 to 11½ mm.; of 20 fr. (\$1.05) per ton from 8 to 9 mm.; of 30 fr. (\$1.58) per ton for 7 to 7½ mm.; of 50 fr. (\$2.63) per ton for 6 to 6½ mm.; of 70 fr. (\$3.69) per ton for 5 to 5½ mm. For export, although demand is not much greater, prices are firmer with a tendency to rise; offers are slightly higher at: beams, £5 7s. 6d. to £5 10s. (1.15c. to 1.17c.); bars, £5 14s. to £5 15s. (1.22c. to 1.23c.). The entente for ordinary rails is not yet concluded, yet an agreement has intervened in regard to the basis price of mine rails: 550 fr. (\$29) per ton, with increased rates as follows: rails of 9 kg. (18 lb. per yard) and more to 20 kg. (37 lb. per yard) inclusive are basis; rails of 7 kg. (14 lb. per yard) to less than 9 kg., increase of 25 fr.; rails of 4.5 kg. (9 lb. per yard) and less than 7 kg., 100 fr. (\$5.27) per ton; cross-bars for mine rails, increase by 50 fr. per ton; side-piece for mine rails, increase by 135 fr. (\$7.11) per ton.

Sheets.—Last week the negotiations for the constitution of the entente were in a good way and hopes were entertained that a settlement of the question would be realized at the end of this week. In the meantime heavy sheets continue weak; light sheets are better situated. It has been said that basis prices of the entente will be 680 fr. (1.60c.) for heavy sheets; 900 fr. (2.12c.) for medium sheets, and 1080 fr. (2.54c.) for light sheets. For export, rates are a little firmer, large flats are at £6 18s. to £7 2s. 6d. (1.47c. to 1.52c.); heavy sheets are at £6 19s. to £7 (1.48c. to 1.49c.); medium sheets at £7 10s. to £7 12s. 6d. (1.60c. to 1.63c. per lb.).

The Ajax Electrothermic Corporation, Trenton, N. J., announces the sale of a 35 kv-a. Ajax-Northrup high frequency converter with small high frequency induction furnaces to each of the following institutions: Bureau of Standards, Washington; General Electric Co., West Lynn, Mass; Vanadium Corporation of America, Bridgeville, Pa; the Thermal Syndicate, Ltd.; Neptune Works, Wallsend-on-Tyne, England; N. M. Post Office Research Station, Dollis Hill, London, England. The last two units are being manufactured in England by the company's representatives and licensees, the Electric Furnace Co., Ltd., London.

BELGIAN MARKET STILL WEAK

Heavy Sheets in Good Demand but Other Materials Depressed—Semi-Finished Steel Makers Busy

ANTWERP, BELGIUM, March 11.—Not much change occurred during the last fortnight; prices remained in general at the same level as lately. The market itself, however, is still weak. Orders available are far from numerous and business is very difficult. The market believes prices have attained their lowest bottom; they are in fact nearly as low as in November last. A good number of the makers have still work for some time. Therefore one may expect that works' position may be consolidated strongly by the smallest movement in transactions.

The inland market in Germany, also, is strongly depressed. Prices obtainable now are decidedly lower than a month ago. Inland prices were so favorable that German makers mostly abstained from quoting for export, except for some special German commodities. We now suffer greatly from French competition. Depreciation of French money has made the makers able momentarily to quote low sterling prices for semi-finished and heavy steel products.

Bars are obtainable in Belgium for export at £5 14s. to £5 15s., being \$27.40 per gross ton (1.22c. per lb.) f.o.b. Antwerp; this, however, for large quantities and basis specification. Belgian consumers must pay 560 and 565 fr.; this means \$28.40, or 1.27c. Beams (joists) are weak. Prices remained £5 9s. to £5 10s. per ton (1.16c. to 1.17c. per lb.) f.o.b. Antwerp for normal sections. Wire rods are more in demand. The export price is £7 (\$33.45) per ton with 665 to 670 fr. (\$33.45) for inland consumption. Hoops also show some movement. Prices for steel (mostly nominal, with only a small amount of business done) are approximately as follows:

	Fr.	Per Lb.
Bars	545 or \$27.00	(1.21c.)
Beams	520 or 26.80	(1.20c.)
Rods	650 or 32.80	(1.46c.)
Corrugated bars	620 or 31.30	(1.40c.)
Hoops	750 to 87.00	(1.69c.)
Cold rolled steel hoops	1,050 or 53.00	(2.37c.)
Drawn steel squares	975 or 49.25	(2.20c.)
Drawn steel, rounds	950 or 48.00	(2.14c.)
Drawn steel, hexagons	1,050 or 53.00	(2.37c.)
Spring steel	1,020 or 51.50	(2.30c.)
Rails	650 or 32.80	
Wire rods	670 or 33.80	

Sheets.—Heavy sheets are still well asked for; prices obtained are favorable. The lighter material is now available in larger quantities and as the demand is not strong prices are weaker. Sheets of 5 mm. thickness (No. 6½ gage) are quoted for export at £7 (1.49c. per lb.) f.o.b. Antwerp, with £7 10s. (1.60c.) for ½-in. sheets. Other noted prices are £8 12s. 6d. (1.84c.) for 3/32-in. and £9 12s. 6d. (2.05c.) for 1/16-in. sheets.

Nominal prices, all f.o.b. Antwerp, with French prices on our market about the same, were approximately as follows:

	Fr.	Per Gross Ton	Per Lb.
Thomas sheets 0.5 mm. (No. 25½ gage)	1,100 or \$55.50	(2.48c.)	
Thomas sheets 1 mm. (No. 19½ gage)	975 or 49.25	(2.20c.)	
Thomas sheets 2 mm. (No. 14 gage)	800 or 40.40	(1.80c.)	
Thomas sheets 3 mm. (No. 11 gage)	730 or 36.35	(1.62c.)	
Thomas sheets 5 mm. (No. 6½ gage)	660 or 33.35	(1.49c.)	
Galvanized sheets 0.5 mm.	2,200 or 111.00	(4.96c.)	
Galvanized sheets 1 mm.	1,675 or 84.60	(3.78c.)	
Average price for polished sheets	1,500 or 75.75	(3.38c.)	

Iron.—The market for this commodity remains weak and depressed. Scrap has fallen in price but not sufficiently to enable makers to have their cost price reduced on the scale required. Quotations (being 10 fr. lower than a fortnight ago) run as follows:

	Fr.
Commercial iron No. 2	570 or \$28.80
Commercial iron No. 3	590 or 29.80
Commercial iron No. 4	610 or 30.80

Semi-Finished Materials.—The market remains well provided with orders. There is no change in prices. Belgian quotations for such material are not suitable for export business. However, makers can wait and therefore are neither disposed nor obliged to discuss

prices. As a guidance, prices (which, for the reason just explained, are only nominal) are:

	Fr.
Thomas billets	505 or \$25.50
Thomas blooms	480 or 24.25
Thomas sheet bars	520 or 26.25

Pig Iron.—Inland demand for phosphorus pig iron is small. The price quoted runs from 350 to 355 fr. Last quotations may also be accepted f.o.b. Antwerp. This price is \$17.90, or about \$21.50 c.i.f. Atlantic ports. Some orders are received from Scotland. Thomas pig iron is available in stock. The price ruling is £3 15s. (\$17.90) f.o.b. Antwerp. It seems, however, that business could develop at somewhat less. Makers would certainly make a concession of price for an immediate shipment. The current analysis of this iron is

	Per Cent		Per Cent
Si	1 max.	Mn	1 to 1.5
S	0.08 max.	P	1.7 to 2

In some cases the S contents are 0.06 per cent maximum. England is the best buyer from abroad for this quality of pig iron.

Semi-phosphorus foundry pig iron (P under 1 per cent) is not made for the moment. Belgian works are, on the other hand, making hematite pig iron. The price of this quality is about 440 fr. f.o.b. Antwerp, i.e., \$22.25. English hematite pig iron is more difficult to sell. Prices have been reduced to about £4 10s. (\$21.40) c.i.f. Antwerp, but with the actual lower rate of franc prices are turning out, for the consumer, higher than for Belgian hematite. French pig iron, both foundry and hematite, are much offered but prices are too high. Luxemburg makers, on the other hand, for their phosphoric foundry pig iron maintain cheap prices for our market; 350 to 355 fr. (\$17.65 to \$17.90).

Scrap.—Scrap is weaker than ever. Business in this department is excessively scarce. Prices have dropped by a further 10 fr. per ton.

Coke.—Syndicate coke is expected to be reduced in price for next month. There is nearly no demand. Large quantities of the ordinary grade are available.

American Sand Testing Ideas Abroad

The Danish Technological Institution of Copenhagen, Denmark, which is cooperating with the geological survey of that country in making an investigation of Danish molding sands and their locations, has asked the chairman of the joint sand research committee of the American Foundrymen's Association for a copy of that association's standard sand testing methods.

A set of the American Foundrymen's Association sand testing equipment has recently been ordered by the French foundry school, Paris, which was organized a few years ago to train foundry workers. This equipment will be used by the school for comparison and development of French sand testing methods. French foundrymen are reported to be giving a great deal of attention to this phase of foundry development.

Steel barrels produced in February by 30 establishments are reported by the Department of Commerce at 413,823, compared with 420,127 in January and with 370,966 in February of last year. Shipments during February are given as 407,781 barrels, compared with 415,040 in January. Stocks at the end of February were 64,402 barrels, while unfilled orders at the end of the month amounted to 1,336,124, a slight decrease from the previous month, but more than double the amount of unfilled orders at the end of February, 1924, when the total stood at 608,660 barrels.

The Division of Simplified Practice, United States Department of Commerce, has issued bulletin No. 18 in the series devoted to "Elimination of Waste; Simplified Practice." This booklet covers the subject of builders' hardware and gives complete data by which manufacturers may follow the rules, practices, finishes, types and sizes of builders' hardware agreed upon in conference of representatives of manufacturers, distributors and users.

RUSSIAN IRON AND STEEL OUTPUT

Steady Increase Since Last Fall in Pig Iron and Steel—Still Far Below Pre-War

BERLIN, GERMANY, March 7.—Production of iron and steel and of certain manufactured metal products in Russia has of late increased, according to direct advices from Moscow. Industry as a whole is seriously depressed. The number of registered unemployed at the close of last year was 1,400,000, and though 700,000 of these were struck from the lists on coming out intentional shirkers the latest report shows 900,000 genuine unemployed. Labor is increasingly inferior in quality, owing to the migration of the old skilled hands to the country.

General production in the last business year (ended Sept. 30, 1924) was worth 1475 million gold rubles. The above value figures are based on pre-war gold prices, and are below present values. Of production costs an average of 22½ per cent goes on wages. Before the war wages made up only 17 per cent of production cost, but wages in themselves averaged 11 per cent more than today. The present average monthly wage is 39 rubles, or, roughly, \$20. That industrial activity has increased in the last years, though it remains far behind pre-war figures, is shown by the following table of values of production:

	Millions of Rubles
1913.....	3,489
1920.....	511
1921-22.....	753
1922-23.....	1,127
1923-24.....	1,475

In the business year ended Sept. 30, 1924, coal output was 52 per cent of the pre-war figure, iron ore 10 per cent, pig iron 15 per cent, steel 25 per cent, rolled goods 19 per cent, all metal products 27 per cent, electrical goods 58 per cent. These percentages show great improvement over the figures of the preceding year. The output of coal was 901,000,000 puds (14,510,000 gross tons), against 713,000,000 puds in the preceding year, and 1,711,000,000 puds in 1913. Output in the first quarter of the current business year (Oct. 1 to Dec. 31, 1924) was 200,500,000 puds.

Views on the iron and steel outlook are more optimistic. The Soviet trade press publishes plans for increasing the use of metal among the peasantry. At present, 70 per cent of iron and steel output is taken by direct state consumers (railroads, etc.) and only 30 per cent is bought by state or private trading concerns for resale to the population. The trusts have been authorized to produce this year 15 per cent more metal than last year. Sales of metal goods to the population have increased since November, when Lenin's successor, Rykoff, publicly repudiated the communist extremists' policy of suppressing private trade, entered upon after Lenin's death. The "Glavmetall" reports that in 1923-24 the peasant population bought metal and metal goods of value only 111,000,000 rubles, or about 5 rubles per family.

Iron and Steel Production Increasing

The first four months, ended Jan. 31, of the current business year witnessed a considerable increase in iron

and steel production; the officially estimated output was exceeded, as shown.

Russian Production of Iron and Steel (In Thousands of Puds)

	Pig Iron			Total In Gross Tons
	Southern District	Urals	Central District	
Estimated monthly output	3,000	1,560	184	76,400
Actual output in:				
October, 1924.....	2,823	1,440	182	71,550
November, 1924.....	2,963	1,760	186	79,050
December, 1924.....	3,585	1,637	190	87,150
January, 1925.....	3,554	1,750	189	88,450
	Steel			
Estimated monthly output	3,000	2,000	1,550	105,450
Actual output in:				
October, 1924.....	3,518	2,271	2,258	129,550
November, 1924.....	3,330	2,200	1,967	120,700
December, 1924.....	3,627	2,797	2,039	136,250
January, 1925.....	4,048	2,946	2,045	145,500
	Rolling Mill Products			
Estimated monthly output	2,170	1,530	1,080	76,950
Actual output in:				
October, 1924.....	2,324	1,370	1,618	85,500
November, 1924.....	2,440	1,304	1,381	82,500
December, 1924.....	2,551	1,847	1,529	95,400
January, 1925.....	2,791	1,638	1,633	97,600

Compared with the figures for January, 1924, the January, 1925, output of pig iron increased 82 per cent, steel 96 per cent, and rolled goods 81 per cent. Compared with the figures for January, 1923, the pig iron output increased by 251 per cent, steel by 190 per cent, and rolled goods 150 per cent.

The government lately announced that it proposes to permit increased imports of machinery. It has since ordered a large number of German textile machines, mostly from Chemnitz in Saxony. Considerable foreign purchases of electrical plant are expected. A plan is on foot to organize 142 lines of interurban motor traffic, for which 1500 motor vehicles of different types will be imported. There is a great demand for farm machinery, but no money for payment. A Kieff Province official report states that 49 per cent of the local peasantry possess no farm machinery or tools of any kind. Railroad traffic has increased, and Commissary Derzhinsky predicts that it will reach the pre-war figure by 1931. The number of sound locomotives is 9000, of freight cars 315,000.

Manganese and Iron Ore

In January the German firm, Rawack & Gruenfeld Co., and the Russian Yuzhnorudnic Trust, a state concern, signed a contract securing to the former the output of the Nikopol manganese ore mines and the iron ore of Krivoi Rog for 1925, with an option for 1926. The output of Nikopol manganese ore in the business year ended Sept. 30, 1924, was 6,000,000 puds, against 17,400,000 puds by the Caucasus Tchiaturi mines. The Nikopol output was approximately three-fifths of that of 1913. The per capita output of iron ore miners in the last business year was 30 per cent of that of 1913. The following table gives comparative production of iron ore.

Russian Iron Ore Production (In Millions of Puds)		
	Business Year Ended Sept., 1924	Business Year, 1913
Krivoi Rog	25.8	387.8
Ural District	24.6	109.9
Central District	2.0	32.14
Other Districts	0.4	32.69
Total output	52.8	562.53
Equivalent in gross tons..	850,000	9,058,000

BELGIAN IRON AND STEEL OUTPUT

January Production Higher Than December and Well Above Pre-War

BRUSSELS, BELGIUM, March 6.—Belgium, during January, had 49 furnaces in blast, against an average of 40 in 1923 and 54 in 1913. The output of pig iron was 249,350 tons, against 246,510 tons in December; 234,000 tons, the monthly average in 1924, and 207,000 tons, the monthly average in 1913.

The output of raw steel was 240,070 tons in January, against 238,750 tons in December, 232,000 tons, monthly average in 1924, and 200,000 tons in 1913.

The output of castings for January was 6090 tons,

against 6260 tons in December, 6800 tons, monthly average in 1924, and 5154 tons monthly average in 1913.

The production of finished steel was 200,410 tons in January, against 207,190 tons in December, 198,000 tons, monthly average in 1924, and 154,922 tons, monthly average in 1913. The production of finished iron was 10,050 tons in January, 16,610 tons in December, 17,500 tons, monthly average in 1924, and 25,362 tons, monthly average in 1913.

More ships were under construction on March 1 than one month earlier, though the tonnage fell. Totals were 170 steel vessels of 173,484 gross tons against 165 of 183,372 tons on Feb. 1.

BOOK REVIEWS

Structural Metallography. By H. B. Pulsifer. Pages viii + 210, 6 x 9 in.; 5 plates and 146 illustrations. Published by Chemical Publishing Co., Easton, Pa. Price, \$5.

According to the author this is an introductory text to the principles, scope and significance of the science called metallography, a science which is growing so rapidly that Dr. Henry M. Howe's statement of 1920 is no longer true. This statement is quoted as a form of dedication and reads: "All our present conceptions of the nature of alloys are due to the microscope."

The book is divided into 12 chapters. The first one covers in beautiful language the importance of metals, and gives the basis of 15 exercises for students. It concludes with a bibliography which is good, but is rather noticeable for its omissions. For instance, no attention is drawn to important magazines such as *Revue de Metallurgie*, *Stahl und Eisen*, and *Zeitschrift für Metallkunde*, nor specifically to the transactions of important societies, such as the Iron and Steel Institute, American Society for Testing Materials, American Society for Steel Treating, etc.

Chapter 2 discusses metal structures and testing. It contains a good deal of controversial material and the language is by no means so clear as the first chapter. In many places it is involved and rather hard to follow; for instance, what is a "higher annealing material" or a "high annealing solid solution." Fig. 14 in this chapter is a very poor representation of laminated pearlite, and is not equal to the other microphotographs, which in general are of a high order of excellence. The few pages on physical testing in this chapter are not very good and, in some cases, are misleading. For instance, a tensile testing machine is not arranged to measure the elongation or reduction of area of a specimen. The standard Izod and Charpy are not shearing tests. The Rockwell hardness testing machine is not mentioned, nor is reference made to the X-ray spectroscope. In regard to sulphur prints, the acid used is more often dilute sulphuric than hydrochloric.

Chapter 3 is a good, clearly written description of the solidification or crystallization of metals. Chapter 4 deals with the smoothing and etching of metal surfaces, and gives in detail a rapid method of successively etching and polishing a specimen which, as the author rightly says, has been used for many years. It is possibly a good method for rapid work, but it would not be a suitable method where the finest definition was desired, or for high-power work. It is certain that many finely dispersed particles would be actually displaced and lost. It is a good chapter but more space could very profitably have been given to the various etching reagents and their use.

Chapter 5 of 11 pages is excellent on photomicrography, and is followed by a chapter on some properties of metals and simple structures. This chapter has a very poor photomicrograph of Babbitt metal and another one with the strange title of "de-carbonized pearlite steel." Chapter 7 deals with some properties of pure metals.

Chapters 8, 9 and 10 take up steel and iron, or as they are called the iron-carbon series. The equilibrium diagram is briefly discussed but no explanation is made as to how graphite forms. The author's statement that the great tonnage of steel manufactured contains between 0.20 and 0.75 per cent carbon can be questioned. The general impression of Chapter 8 is that it is not thorough nor so carefully treated as some of the others.

Chapter 9 takes up iron and steel castings. It is doubtful whether the white material in the common gray iron of Fig. 94 is cementite. The section on malleable iron is very good. Chapter 11 on worked metal is good, interesting and thoughtful and is followed by a very brief discussion of the major alloys including alloy steels.

On the whole, the book shows a wide knowledge of

the literature. It is largely original and by no means only a compilation. However, it is not to be recommended as a textbook for young students. It is far better adapted for graduate or advanced students. The illustrations on the whole are particularly good, especially the splendid photographs by O. V. Greene.

G. B. WATERHOUSE.

Transmission Towers

Under the title of "Transmission Towers" the American Bridge Co. has issued a beautifully bound book of 182 pages dealing with the design and erection of towers for the transmission of electric energy. Many illustrations, both photographic and diagrammatic, are used to illustrate the points covered in the book, while diagrams show methods of designing for certain sets of conditions. Wind stresses, ice loading and other features occurring in use are taken care of by appropriate section elements. Designs are given also for wireless towers, reaching a maximum height of 820 ft., or somewhat greater than the height of the Woolworth Building.

Among the tables are those specifying the structural details of towers of different sizes and heights and for different characteristics in use. The data are given in considerable detail, the table covering the weight of section, the gross area, the net area and the pounds of bearing per square inch of net area. Sag curves for different gages of wire for different spans between towers are shown in a series of curves worked out on double logarithmic paper, the sag being given in feet for each gage of wire and each length of span.

German Electric Steel Since the War

Some interesting light has recently been thrown on Germany's electric steel industry. Detailed data of production for the war and post-war years have been published in *Stahl und Eisen*. These data for the five years since the war, compared with 1913 and the largest war output, are as follows in metric tons:

Year	Ingots	Castings	Total
1919.....	67,085	14,673	81,741
1920.....	75,679	12,046	87,725
1921.....	70,236	8,821	79,057
1922.....	93,327	11,717	105,044
1923.....	65,427	13,756	79,183
1913.....	65,088	23,793	88,881
1918.....	157,375	82,662	240,037

If the average for the five post-war years is taken—86,554 tons per year—the rate of output since the war has been fully equal to the 1913 or pre-war volume. The principal decline has been in electric steel castings, the average since the war of about 12,000 tons per year being only about half the 1913 output. The extent to which electric steel was a factor in the war is shown by the 1918 production.

At the end of 1920 there were 68 electric furnaces in Germany, with 50 the number at the close of 1922.

Ten years of scientific and industrial achievements are to be covered in a publication sponsored by the Société de Chimie Industrielle, 49 Rue des Mathurins, Paris. The book, which will have the title "1914-1924, Dix Ans d'Efforts Scientifiques et Industriels," is to have 3000 pages, and subscriptions are now being received at a price of 120 fr. until June 1, after which the price will be 200 fr., subscriptions to be entered at the headquarters of the society. Besides contributions on applied chemistry, the book will also contain financial statements of each of the French industries allied to the chemical field, covering also the developments in the French colonies in respect to the production of basic raw materials.

Both imports and exports of finished manufactures and of semi-manufactured goods were a smaller proportion of total American trade in the first eight months of the 1925 fiscal year than was the case last year. Due to the increasing volume of commerce, however, the amounts were larger, although the proportion fell off.

NEW TRADE PUBLICATIONS

Brass and Copper Data Book.—Bridgeport Brass Co., Bridgeport, Conn. A pamphlet of 48 pages, covering prices and weights of sheet brass, brass rod, wire, condenser tubes, and seamless brass and copper tubing. The information is given in great detail in tabular form, with comparison of gage numbers for wire and sheets and other conversion tables. Information is given also about processes of manufacture and tempers of brass and copper products.

Electrodes.—General Electric Co., Schenectady, N. Y. Illustrated booklet of 16 pages describing characteristics and applications of the three types of General Electric electrode, designated as types A, B and C. Brief instructions are given covering the use of each type.

Sine Wave Generator.—General Electric Co., Schenectady, N. Y. Bulletin No. 42567 describes its sine wave generator. The bulletin is in the form of a four-page leaflet containing, besides the text, photographs, charts, diagrams and tables. The different testing applications of this generator are explained.

Gas Holders.—Chicago Bridge & Iron Works, 2011 Old Colony Building, Chicago. Twelve-page illustrated bulletin showing installations of Horton gas holders and giving what is said to be the first information ever published on the welding of gas holder crowns and bottoms.

Flexible Couplings.—Falk Corporation, Milwaukee, Wis. Eight-page illustrated bulletin, No. 35, describing Falk-Bibby flexible couplings. Freedom from wear, easy disconnection, flexibility, torsional resiliency, lubrication and high capacity are features stressed. The pages are 8 1/2 x 10 1/2 in.

One-Piece Steel Poles.—Viele, Blackwell & Buck, 49 Wall Street, New York. Bulletin No. 12 of four pages, describing the one-piece seamless tubular steel poles manufactured by the Mannesmann Rohren-Werke, Germany. These poles are available in various lengths and wall thicknesses and in diameters up to 12 in.

Turbine Pumps.—Ulmer Machinery Corporation, Los Angeles, Calif. Folder of 26 pages containing numerous illustrations of pumps with various types of heads for work requiring from 7 1/2 to 90 hp. Features of construction are outlined and line sketches show the arrangement of parts.

Diesel Oil Engines.—De La Vergne Machine Co., 943 East 138th Street, New York. Folder summarizing the advantages of the company's vertical Diesel oil engines, which employ the pump injection arrangement in place of an air compressor for forcing oil into the cylinder.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. Engineering Information Sheet No. 165 E, devoted to a description of the application of ball bearings to an automatic knife handle machine.

Wire Cloth and Screens.—Newark Wire Cloth Co., 351 Verona Avenue, Newark, N. J. A 64-page catalog giving complete information with list prices on double-cripped heavy steel wire screens, coal screens, steel wire cloth, brass, copper and bronze wire cloth, extra fine phosphor bronze wire cloth and other wire cloth products. The catalog goes into the uses of monel metal and gives sizes of monel metal wire cloth carried in stock by the company. Five pages are devoted to new U. S. standard testing sieves, foundry riddles and dipping baskets being included. Many photographs are shown to illustrate the multitude of weaves, spaces and combinations used in the manufacture of wire cloth, the largest shown being 1 x 1 in. and the finest a twill weave 325 meshes to the inch, the diameter of the wire being 0.0014 in. and the opening 0.0017 in.

Fans and Blowers.—American Blower Co., Detroit. A 72-page illustrated catalog giving complete engineering data on "Sirocco" fans and blowers. Leaflets have also been sent out by this company giving details of the "ABC" air washing and cooling fan and the American direct-fired unit heater.

Bending Machines.—Wallace Supplies Mfg. Co., 1310 Diversey Parkway, Chicago. Bulletin No. 21, 32 pages with cover, illustrating and describing the products of this company, which include machines for bending pipes, tubes, angles, channels, reinforcing bars, flats, squares, rounds and special sections; also shears, punches, rod cutters, bench legs, gongs, ball bearings, storage cabinets, etc.

Milling Machines.—Ingersoll Milling Machine Co.

A 4-page leaflet illustrating various types of adjustable rail milling machines and giving a list of the prominent users of such machines. Space is also given to illustrations of Ingersoll inserted tooth milling cutters.

Refractories and Furnace Design.—Philbrico Jointless Firebrick Co., Kingsbury at Clay Street, Chicago. An illustrated catalog, 36 pages with cover, devoted to a complete treatise on the building of monolithic furnace linings with "Philbrico," by the use of which, it is claimed, furnace life is increased. The booklet will be of interest to all users of industrial furnaces of whatever type.

Lift Trucks.—Barrett-Cravens Co., 1323 West Monroe Street, Chicago. Three bulletins, Nos. 100, 101 and 103, go into detail concerning the new Barrett lift truck model F.

Riveters.—Hanna Engineering Works, 1765 Elston Avenue, Chicago. A 4-page leaflet illustrating and describing the Shepard pinch-bug riveters, which is designed for all classes of structural riveting.

Wire-Forming and Automatic Machines.—Baird Machine Co., Bridgeport, Conn. An 8-page bulletin illustrating and describing Baird wire-forming machines and Baird automatic machines for various forming and stamping operations. Two pages are devoted to the 6 x 6-in. six-spindle horizontal chucking machine.

Steel Belts.—Power Engineering Co., Youngstown. A leaflet illustrating and describing the Endural endless steel belts for power transmission drives and conveyors. These belts are made from alloy steels produced in the company's own mills and are guaranteed to be rustless and stainless.

Drill Rods and Cold Drawn Specialties.—The Anchor Drawn Steel Co., Latrobe, Pa., has issued a catalog detailing its various lines of high speed and carbon drill rods and special shapes, high speed stainless, alloy, carbon and special analysis steels. Special shapes are illustrated, and drill rod prices are given.

Picklelette Pickling.—William W. Hearne, Inc., Philadelphia and Pittsburgh. Booklet of 20 pages dealing with the use of a mixture to avoid the fumes and odors incident to the usual pickling process, to avoid large acid consumption, pitting and loss of weight in the steel, etc. It is stated that many other advantages accompany the use of this material when the operation is carried on in accordance with definite instructions.

Continuous Wire Drawing Machines.—O. & J. Machine Co., Worcester, Mass. A 12-page loose-leaf catalog of Oslund continuous wire drawing machines of 2, 4 and 6 blocks. The catalog shows groups of 6-block machines operated by one man and producing more than 5000 lb. of wire per 10 hr. at a finishing speed of 175 r.p.m.

Sand Tester.—Reynolds Electric Co., Chicago. Bulletin 701, a 4-page folder, describes the "Reco" sand tester for testing the cohesiveness of molding sands.

Hardness Testing.—Herman A. Holz, 17 Madison Avenue, New York. Bulletin No. 27, a 6-page folder, discusses "the best method," "the best machine to apply the best method" and "the best accessories to the best machine."

Forged Steel Pipe Flanges.—American Spiral Pipe Works, Chicago. Catalog No. 24 of 88 pages describes forged steel flanges, embodying the new American engineering standards of 400, 600 and 900 lb. per sq. in. working steam pressure. The work consists in the main of drawings, with accompanying tables of dimensions and price lists. The tabular matter is very complete, while a good many special fittings are shown. Data are given on bolt stresses, dimensions of standard, extra strong and double extra strong pipe, drilling templates and descriptions of corrugated furnaces for marine type boilers.

A great deal of useful information is contained in the new general catalog, designated as the No. 138, issued by the Brown & Sharpe Mfg Co., Providence. There are 600 pages, in which are listed the company's complete line of machinery tools, cutters and attachments. Several new items are cataloged. Half-tone engravings are used to illustrate each piece of equipment and detailed descriptions as well as tabulated specifications and dimensions are given. The catalog is of pocket size.

Alignment limits and testing method used in the building of Ohio milling machines, grinders and tilted rotaries are described and illustrated in a new catalog of the Oesterlein Machine Co., Cincinnati.

Plans of New Companies

The Wayne Auto Equipment Co., Fort Wayne, Ind., has been organized with capital of \$150,000 to act as jobber in automobile parts and equipment.

The Grand Travers Metal Casket Co., Lake Avenue and Ninth Street, Travers City, Mich., organized with \$25,000 capital stock, will manufacture metal caskets and undertakers' supplies. It has purchased a building, has installed the necessary machinery and is in production.

The Motor Parts Corporation, 2508 Grand River Avenue and 2517 Third Street, Detroit, has been organized to handle motor parts on a jobbing basis. It will carry stock of precision wrist pins and piston rings, crank shafts, bushings, timing gears, etc. Machine work taken in by the company will be let out on a contract basis. A. J. Perner is treasurer.

The Sterling Stool & Step Ladder Co., Sterling, Ill., recently incorporated with \$5,000 capital stock, is constructing a plant to manufacture step tools and ladders. Purchases of machinery and equipment have not been completed. Officers are: John M. Powers, president and general manager; Thomas McCue, vice-president and treasurer, and A. T. Scoville, secretary.

The Standard Window Equipment Co., with main office at Davenport, Iowa, and factory at East Moline, Ill., has been incorporated with \$50,000 capital stock to manufacture window locks, automatic check rails and products of like nature. All manufacturing is done on a contract basis. B. H. Hufferheide is secretary.

Trade Changes

The E. L. Essley Machinery Co., 531 Washington Boulevard, Chicago, has been appointed exclusive selling agent in the Chicago territory by the J. N. Lapointe Machinery Co., New London, Conn., manufacturer of broaching machines.

The Homestead Valve Mfg. Co., Homestead, Pa., has appointed the following distributors to handle its entire line of valves and other products: W. A. Case & Sons, 72 St. Paul Street, Rochester, N. Y.; Fulton Supply Co., Atlanta, Ga.; Charles A. Setzer, 725 Realty Building, Charlotte, N. C.

The Lakeview Drop Forge Co., Erie, Pa., recently organized and at present occupying part of the plant of the Lake Side Forge Co., which is in process of liquidation, is working out plans that will call for a new location elsewhere in Erie. E. W. Nick is president of the Lakeview company.

The W. J. Westaway Co., Hamilton, Ont., Canada, has been appointed district representative for the sale of Sykes herringbone gears and reduction units by the Farrel Foundry & Machine Co., Buffalo, to cover the eastern half of the Province of Ontario.

The Standard Turbine Corporation, Scio, N. Y., has appointed Howell Ross Hanson, 2200 Packard Building, Philadelphia, district representative.

The National Malleable & Steel Castings Co., Cleveland, manufacturer of railroad and marine specialties and automobile castings, has moved its branch office in Chicago to 501 Railway Exchange.

The Boston Gear Works Sales Co., Norfolk Downs, Mass., has opened a distributing warehouse and sales office in Philadelphia, at Eleventh and Arch Streets. Standardized gears, speed reduction units, silent chain drives and other standardized power transmission equipment will be kept in stock.

J. F. Haldeman, contracting engineer, has moved from 6601 Kelly Street, to 310 Whitfield Building, Pittsburgh.

The Globe Steel Tubes Co., Milwaukee, has opened a district sales office at 444 Frisco Building, St. Louis, in charge of E. C. Carroll of Milwaukee, who has been appointed district manager of sales.

The United States Refractories Corporation, Mount Union, Pa., has discontinued its Pittsburgh and Philadelphia offices. All communications should be addressed to the Mount Union office.

The Starr Equipment Co., Arrott Building, Pittsburgh, material handling equipment, has moved to Room 1124 Park Building.

The Standard Turbine Corporation, Scio, N. Y., has appointed the Hale-Stephan Co., 7016 Euclid Avenue, Cleveland, district representative there.

The Carroll-McCreary Co. has been incorporated with \$60,000 capital stock as jobber of steel products, carrying a complete stock of sheets, nails, bar steel, bolts, structural steel, etc. Office and warehouse are located at Borden and East avenues, Long Island City, N. Y. W. J. Carroll, formerly with J. K. Larkin & Co., is president; B. F. McCreary, formerly with the same company, is vice-president, and Norman Serphos, treasurer.

The Clausen-Bohn Machine Co., Sterling and LaRue Streets, Streator, Ill., recently incorporated with \$20,000 capital stock, has been organized principally to handle general repair work, but will also consider manufacturing propositions. It has built a new shop. The officers are: President, D. A. Clausen; vice-president and general manager, H. O. Bohn; secretary-treasurer, George Connolly.

The Excel Pattern & Foundry Co., 2906 Carroll Avenue, Chicago, recently incorporated with \$15,000 capital stock, will manufacture pattern maker's brass and aluminum castings. It has leased a plant which is fully equipped. Officers are: Peter J. Murphy, William Elsner and George Grosmeier.

The Nuway Boiler & Engineering Co., 53 West Jackson Boulevard, Chicago, recently incorporated, will have its products made by contract according to specifications. They include Nuway supercirculation boilers, breechings, plate work, etc. Officers are: P. G. Kaiser, president; E. A. Kaiser, secretary-treasurer.

The American Cash Register Co., Saginaw, Mich., now operated by Edwin C. Peters and John B. Martin, receivers, will be reorganized later. They have taken out a charter under Michigan laws naming capital stock of \$500,000 preferred and 25,000 shares of no par common. The company has a large plant fully equipped, and has been in operation for 25 years, having shipped to all parts of the world. Plans will be noted in this column later.

The Drake Mfg. Co., Inc., Friendship, N. Y., has changed its name to the Drake Electric Hoist Co., with the same address.

The Carlem Engineering Co., engineer and dealer in reinforcing bars, wire mesh, steel forms, lath, etc., has moved into its new office building which adjoins the works at 6949 Lynn Way, Pittsburgh.

Gray Iron Piston Maker Organized

Plant and equipment have been purchased by the De Luxe Products Corporation, Laporte, Ind., purchaser of the Clark-Turner patents on the De Luxe light-weight gray iron piston. By April 1 production will be started and gradually will be developed to several thousand pistons daily. Castings are to be furnished by Cannon, Wyant & Campbell, Muskegon, Mich.

About two million of this new type piston were manufactured by the Clark-Turner Co. of Los Angeles, Cal., before the plant was razed by fire. This was followed by the death of Mr. Clark, and the company decided to lease manufacturing rights. The piston is made of high-quality gray iron and is but a few ounces heavier than aluminum and alloy pistons.

The new company has moved into a plant leased from the Niles & Scott Co., Laporte, and the entire equipment of the Walker Piston Co. of Cleveland has been purchased, the machinery to be taken to Laporte and installed immediately. Agencies for these pistons are established throughout the United States, Canada, England, Germany, South Africa, South and Central America, Australia and New Zealand.

Hobart M. Cable, president of the manufacturer by that name, of Laporte, is president of the new company, and L. C. Bassford, chairman of directors of the Aluminum Products Co., Chicago, is vice-president. Landon C. Boyd, formerly chief engineer of the Universal Machine Co., Bowling Green, Ohio, for several years, is treasurer and general manager.

The Algoma Steel Corporation's plant at Sault Ste. Marie, Ontario, Canada, has opened its rail mill to operate on orders from the Canadian National and Canadian Pacific railroads. The Canadian National Railway is believed to have placed orders for 45,000 tons of track equipment.

The Werner & Pfleiderer Co. of Germany, a division of the Baker-Perkins Corporation, 25 West Forty-third Street, New York, is negotiating with two foundries to manufacture in this country the hydraulic compressed air accumulator which has been made by the German firm for several years.

STEEL AND INDUSTRIAL STOCKS

The range of active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	76	81½	Int. Har.	96½	102½
Allis-Chal. pf. .	106	106	Int. Har. pf.	114	114½
Am. B. S. & Fdy. 92%	97	97	Jones & L'lin pf. 115	115	115
Am. Can.	166	173½	Lima Loco.	63	65
Am. Can. pf.	117	118½	Nat.-Acme	4¼	4¾
Am. Car & Fdy. 197	207	207	Nat. En. & Stm. 31	32	32
Am. C. & F. pf. 124	124	124	Nat. En. & S. pf. 83	83	83
Am. Locomotive. 122	129	129	N. Y. Air Brake 45	47	47
Am. Loco. pf.	119½	120	Otis Steel	8½	9
Am. Radiator ..	95	96¾	Otis Steel pf.	51	52½
Am. Stl. Fdries. .	47½	49¾	Pressed Stl. Car 54¾	57½	57½
Am. Stl. Fd. pf. .	108½	110	Pressed Steel pf. 83	85	85
Bald. Loco.	109½	122¾	Replogle Steel ..	13¼	15½
Bald. Loco. pf. .	112	113	Republic	45¾	49
Beth. Steel	38¾	41½	Republic pf.	88	88¾
Beth. Stl. 7% pf. 94½	95½	95½	Sloss-Sheffield ..	81¼	84
Beth. Stl. 8% pf. 109¾	110½	110½	Superior Steel ..	23¼	27
Br. Em. Stl. 2 pf. 9½	9½	9½	Transue-Wms. .	25¾	27
Chic. Pneu. Tool 82	84	84	Un. Alloy Steel..	25¾	27¾
Colo. Fuel	33½	36¾	U. S. Pipe	172½	189¼
Crucible Steel ..	66	69½	U. S. Pipe pf.	103	103
Crucible Stl. pf. .	94	94	U. S. Steel	115	120¼
Deere pf.	90½	90½	U. S. Steel pf. .	122½	123¼
Gen. Electric ..	256½	270½	Vanadium Steel. 26	27½	27½
Gt. No. Ore Cert. 33½	35	35	Va. I. C. & Coke 37	37	37
Gulf States Steel 67½	72	72	W'house Air Br. 99½	103	103
Inland Steel ...	42	44½	Y'gstown S. & T. 63	67	67

Industrial Finance

Involuntary bankruptcy proceedings against the Triumph Electric Co., Cincinnati, have been filed in the United States District Court, Cincinnati, by the McIlvain & Spiegel Boiler & Tank Co. and others. Sanford Brown, receiver, has asked dismissal of the proceedings, declaring that the company is not and has not been insolvent and that at no time has it made a general assignment for the benefit of creditors. Its current and permanent assets are far in excess of total liabilities. The company is solvent and is able to pay its obligations if assets are properly conserved.

Net earnings of the American Chain Co. for 1924, after all charges were \$1,753,765 compared with \$3,098,684 in 1923. Operating income was \$3,384,777 against \$4,776,116. After dividend allowance \$553,765 was left for surplus.

Public auction of real estate of the Westcott Motor Car Co., Springfield, Ohio, under a decree issued in the United States District Court, will be held April 4. No bid will be received for less than \$75,000.

The Cleveland Cliffs Iron Co., Cleveland, reports net profits for 1924 of \$862,524 as compared with \$3,092,114 in 1923. Operating profit was \$1,529,535. After deducting \$1,200,000 for surplus, there was a deficit of \$337,475. The company operates iron ore mines in the Lake Superior district, a lake fleet, two charcoal blast furnaces and coal mines. President W. G. Mather in his report does not offer much encouragement to stockholders for better earnings in 1925. "Although the volume of iron ore traffic will be greater," he said, "the keen competition for business is likely to result in lower prices."

The 1924 report of the Union Twist Drill Co., Athol, Mass., shows net profits after depreciation, but before taxes, of \$51,440, compared with \$376,448 in 1923 and an operating loss of \$146,241 in 1922. As of Dec. 31, last profit and loss surplus stood at \$1,942,730, whereas at the close of 1923 it was \$2,036,334, and \$2,103,039 in 1922. Quick assets of \$2,216,954, and liabilities of \$111,259, were shown. During 1924 the company reduced its outstanding 7 per cent first mortgage indebtedness from \$1,500,000 to \$1,226,000.

The Wellman-Seaver-Morgan Co., Cleveland, reports net profits of \$43,151 in 1924, compared with \$8,341 in 1923, and a loss of \$143,112 in 1922. Improvement in its credit position is reflected in the balance sheet which shows ratio of current assets to current liabilities of about six to one. During the year the inventory was cut from \$1,013,287 to \$603,119 and \$138,500 of preferred stock was retired.

The Peerless Truck & Motor Co., Cleveland, reports an operating loss of \$934,409 in 1924 against a profit of \$706,468 in 1923. Various deductions brought the year's net loss to \$1,694,177.

An involuntary petition in bankruptcy, asking the appointment of a receiver for the American Sash Weight Foundry Co., Davenport, Iowa, was recently filed with the Federal court on behalf of employees who presented claims for back wages. Arthur Wagner was named temporary receiver by the referee in bankruptcy.

The Wagner Electric Corporation's 1924 report shows gross profits on sales, after all costs of manufacture, maintenance and depreciation, to be \$1,065,406. After deducting \$908,537 for administrative expenses and other items, net profit was \$35,030. The statement of current assets shows: Cash, \$389,835.21, United States Treasury certificates \$891,956. General sales for 1924 were 16 per cent less than in 1923,

but the 1926 bond maturities were called in 1924, reducing the bonded indebtedness to \$2,400,000.

The Harbison-Walker Refractories Co. showed net profits for 1924 of \$3,496,113, after charges, depreciation and Federal taxes. This compared with \$3,651,582 in 1923.

Net income of the Advance-Rumely Co., manufacturer of agricultural machinery, for 1924, was \$435,736, after interest, depreciation, etc. This compares with a net loss for the preceding year of \$257,365.

Good Earnings for Sloss-Sheffield

In view of the low prices obtaining for merchant iron last year, the earnings of the Sloss-Sheffield Steel & Iron Co. shown in a recent report are notable. Net profit for 1924 was \$1,516,276, after interest, depreciation and Federal taxes, against \$2,491,019 in 1923 and \$578,894 in 1922. Current assets as of Dec. 31, compared with current liabilities as \$5,978,096 to \$944,385.

A striking feature of the report was the gain in working capital. Current assets on Dec. 31, 1924, were \$5,978,096 and current liabilities, including tax reserves, \$1,170,385, leaving working capital of \$4,807,711, against \$3,170,726 at the close of 1923. Most of this increase was in cash which stood at \$1,986,315, against \$833,019 a year previous. Last year the company absorbed by purchase the Alabama Co.

Wheeling Steel Corporation Election

Directors of the Wheeling Steel Corporation, whose terms expired this year were reelected at the annual meeting of the stockholders held in Wheeling March 24, which was a somewhat livelier affair than such meetings usually are. Some holders of common stock in the company sought to force a declaration of policy on the part of the management with regard to size of the company's reserve, which they held was affecting dividends on the common stock. After much discussion of this and other features of the annual report of the company, a vote of approval of the acts of the directors was adopted with acceptance of the annual report. D. Alan Burt, Edwin C. Ewing, Andrew Glass, Edward Hazlett, Dwight H. Wagner and Alan H. Woodward, were the directors who were reelected. Directors organized by reelecting the present officers, who are, Alexander Glass, chairman, Alan H. Woodward, vice chairman, Isaac M. Scott, president, Andrew Glass, vice-president in charge of operations, William H. Abbott, vice-president in charge of sales, William H. Manning, treasurer, Charles J. Hunter, secretary. The executive committee comprises, Alexander Glass, chairman, Edwin C. Ewing, J. J. Holloway, Chester R. Hubbard, Isaac M. Scott, Albert C. Whitaker and Alan H. Woodward.

British Empire Steel Corporation Deficit

In its annual report for the year ending Dec. 31, 1924, the British Empire Steel Corporation, Montreal, Que., makes the poorest showing in its history, total operating income falling short by more than 50 per cent of bond interest requirements. Other charges such as depreciation, sinking fund, bond discount and preferred dividends paid during the year created a profit and loss deficit of nearly \$2,500,000, which completely wipes out the surplus accumulated since organization and reduced the surplus as at date of organization heretofore carried forward intact by \$1,326,588. The corporation liquidated \$3,500,000 of its inventories. Total earnings for the year, after all manufacturing, selling and administration expenses had been deducted, amounted to \$923,774, as compared with \$4,444,346 for the previous year. Provision for sinking funds, depreciation and depletion of minerals is the same as in 1923, \$1,112,515.

National Enameling Agreement

An agreement has been reached between factions of the National Enameling & Stamping Co., in which differences have been compromised by forming a new board of directors on which five new members will sit. Charles Hayden, C. D. Marshall, Otto H. Falk, Leonard A. Bushby and Fred C. Pritzlaff, the latter a large holder of preferred stock, represent the opposition group. They replace A. W. Niedringhaus, F. C. Kieckhefer, Sol Richman, Harry M. Pflager and Charles M. Turner. A sixth director was re-elected, being agreeable to both sides. It was agreed that the board of directors will elect A. J. Kieckhefer as president to succeed G. W. Niedringhaus, who will be elevated to the chairmanship, a newly created office.

Machinery Markets and News of the Works

RAILROADS INQUIRE

New Business in Sight in the Chicago Territory

Chicago, Burlington & Quincy Issues List of 53 Items It Requires and Other Roads Come Into Market

THE machine-tool market was enlivened last week by the issuance of new railroad inquiries in Chicago, chief among which is the list of the Chicago, Burlington & Quincy, asking for prices on 53 items of shop equipment. The New York Central inquired for five machines, the Santa Fe for six and the Chicago Union Station Co. is in the market for nine. The Chicago trade

finds encouragement in this indication of possible railroad buying, although in other directions the market is exceedingly quiet.

This quietness extends to all sections of the country, there being only a very moderate demand for tools from industrial companies. An inquiry for 19 tools from the Virginian Railway is the largest prospective business in the East.

In the automobile industry, the most promising prospect is in a report that Dodge Brothers, Detroit, will make certain changes in production methods that will necessitate the purchase of considerable new equipment. The Nash Motors Co. continues as an active buyer.

Makers of multiple spindle drills and high-speed presses in light and medium sizes are doing a better business than the average of machine-tool buying, thus indicating the interest of manufacturers in production equipment.

New York

NEW YORK, March 31.

OCCASIONAL orders for machine tools are being received by local offices, but there is no "snap" to business. One of the best sales of the week was a Blanchard grinder with 60-in. magnetic chuck, which was purchased by a Pennsylvania heating equipment manufacturer for about \$21,000. There is a fairly good demand for light and medium presses for high-speed work and multiple spindle drills are also being sold in fair numbers, thus indicating that manufacturers today are mostly interested in production equipment. The American Car & Foundry Co. has bought a 400-ton wheel press. A 600-lb. steam hammer was sold to Sanderson & Porter for a client at Cheat Haven, Pa. Other sales of the week were mostly small and unimportant.

The Compagnie Francaise pour L'Exploitation des Procédés Thomson Houston, Service Central des Approvisionnements, 173 Boulevard Haussmann, Paris, France, desires information covering machines for making flexible metal tubing of diameters ranging from 6 to 300 mm. ($\frac{1}{4}$ to 12 in.). The company wishes the information to include photographs or drawings of the machines, with prices, and such characteristics as the weight, speed, productive capacity, together with information also concerning any accessories which may be needed.

Expenditures of about \$9,000,000 have been approved by the Council of Ministers for State railroads in 1925-26, involving renewals of rail, locomotives, freight cars, coaches, bridges and signals. The material will be bought by public tender through the Ministry of Communications on Egyptian State Railways.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until April 14 for 5700 lb. crankshafts for the Brooklyn Navy Yard, schedule 3524.

The Neidich Mfg. Corporation, 1450 Flushing Avenue, Brooklyn, has inquiries out for a punch press.

S. Karpen & Brothers, Jackson Avenue, Long Island City, manufacturers of furniture, have awarded a general contract to the Thompson-Binger Co., 103 Park Avenue, New York, for a six-story addition, 120 x 240 ft., to cost \$675,000 with equipment. Buchman & Kahn, 49 West Forty-fifth Street, New York, are architects.

A company known as the American Power Co. has acquired the power plants and property of the Guayaquil Light & Power Co., Guayaquil, Ecuador, for \$2,000,000. Plans are under way for extensions, including the installation of additional power equipment and transmission lines. R. P. Butrick, American Consul, Guayaquil, has information regarding the project.

The Edorn Lumber Corporation, 412 East 110th Street, New York, has purchased property, 130 x 400 ft., at Leggett Avenue and Barry Street, and plans the erection of a two-story lumber and wood-working mill, to cost about \$75,000 with machinery. It will also build a one-story automobile service, repair and garage building for its trucks and cars.

Manual training equipment will be installed in the two-story junior high school to be erected on Center Avenue, New Rochelle, N. Y., estimated to cost \$100,000, for which a general contract has been let to H. H. Vought & Co., Grand Central Terminal, New York. Starrett & Van Vleck, 8 West Fortieth Street, New York, are architects.

The Finnish Government Water Power Office, Helsinki, Finland, is taking bids until May 1 for switching equipment, transformers, etc., for the Imatra water power project.

The Stuyvesant Fixture Co., Inc., 87 East Tenth Street, New York, manufacturer store fixtures, etc., has leased a portion of the building at 312-16 East Ninety-fifth Street, 75 x 100 ft., for new works.

William Higginson, 15 Park Row, New York, architect, has plans for a two-story automobile service, repair and garage building, 100 x 200 ft., at Elmhurst, L. I., to cost \$75,000.

A cold storage and refrigerating plant will be installed in the new six-story slaughter house, 123 x 150 ft., to be erected at 512-31 Eleventh Avenue, New York, estimated to cost \$300,000 with equipment, to be occupied under lease by the New York Stock Yards Co., foot of West Sixtieth Street, and George Kern, Inc., 349 West Thirty-seventh Street. Stadler, Levine & Cravin, 29 Broadway, are architects.

The Compagnie des Tramways et Eclairages Electriques de Salonique, Saloniki, Greece, is planning the construction of an electric power house, as well as substations and lines. New rolling stock will be purchased, also. The company has recently increased its capital, providing, in part, for the expansion. L. B. Morris, American Consul, Saloniki, Greece, has information regarding the project.

The Renaissance Bronze & Iron Works, 3878 Park Avenue, Bronx, New York, has filed plans for a one-story foundry, 35 x 95 ft., at Long Island City, to cost about \$25,000. Oscar Goldschlag, 1482 Broadway, New York, is architect.

Fuller & Robinson, 95 State Street, Albany, N. Y., architects, will take bids early in April for a four-story automobile service, repair and garage building at 99 Washington Avenue, 52 x 225 ft., to cost approximately \$155,000.

The Board of Education, Hudson Avenue and Tenth Street, West New York, N. J., plans the installation of manual training equipment in a proposed three-story high school, estimated to cost \$450,000, for which preliminary plans are being drawn by William Mayer, Jr., 711 Bergenline Avenue, architect.

A new company now being organized with a capital of \$60,000 to manufacture window screens and other woven wire products, is in negotiation with the Board of Trade, Newton, N. J., relative to a suitable site for a proposed plant, to give employment to about 40. Thomas E. Murray, chairman of the industrial committee of the board, has information regarding the project.

F. William Stocker, 501 Eighth Street, Hoboken, N. J., engineer, has inquiries out for cranes, hoists, derricks, boilers, tanks and other kindred industrial equipment.

The plant of the McNab & Harlin Mfg. Co., Straight and Taylor Streets, Paterson, N. J., heretofore used for the manufacture of iron and brass castings, steam specialties, etc., has been acquired at a receiver's sale by the Bryant Mfg. Co., 87 Hester Street, New York, for \$175,000, and will be remodeled for another line of manufacture, exact nature of which has not been announced.

The Jersey Central Power & Light Co., Belmar, N. J., will take over and consolidate a number of light and power companies operating in the central portion of the State. The purchasing company will be capitalized at \$10,000,000 and plans an immediate bond issue, a portion of the fund to be used for extensions and betterments.

The Board of Education, Long Branch, N. J., plans the installation of manual training equipment in a proposed three-story high school, estimated to cost \$500,000, for which bids will soon be asked on a general contract. Ernest A. Arend, Kinmouth Building, Asbury Park, N. J., is architect.

The Central Storage Battery Co., care of G. R. Walsh, 272 North Broad Street, Elizabeth, N. J., organized with capital stock of \$125,000 to manufacture storage batteries, will be in the market for materials and equipment.

The Perkins Mfg. Co., 785-87 South Fourteenth Street, Newark, incorporated with capital stock of \$125,000, will manufacture automatic oil cut-outs, oil meters and leak rings for automotive use. Castings and machining are done by contract. It contemplates building or leasing a plant in the fall and will be in the market for springs, equipment, aluminum castings, etc. The company is interested in receiving estimates on its work. James O. Perkins is president.

Philadelphia

PHILADELPHIA, March 30.

BIDS will soon be asked by David Weber & Co., Fifth and Locust Streets, Philadelphia, manufacturer of paper boxes and containers, for the erection of a three-story plant, 205 x 490 ft., to cost \$100,000 with machinery. The Ballinger Co., Twelfth and Chestnut Streets, is architect and engineer. David Weber is head.

The American Ice Co., City Center Building, Philadelphia, has acquired property at Lancaster Avenue and Sixtieth Street for \$30,000, and is said to be planning the erection of a new ice-manufacturing plant.

J. W. Thompson, 703 South Sixtieth Street, Philadelphia, architect, has completed plans for a two-story addition to the automobile repair, service and garage operated by Paul Becker at 6044-48 Hazel Avenue, to be 60 x 113 ft., estimated to cost \$50,000.

Fire, March 21, destroyed a portion of the plant of the Shoemaker Fertilizer Co., Delaware Avenue and Venango Street, Philadelphia, with loss reported in excess of \$50,000 with equipment. Rebuilding plans are under consideration.

C. M. Roswell, Jefferson Building, Philadelphia, machinery dealer, has inquiries out for two steam boilers, 600 to 800 hp., to operate at 200 lb. pressure.

The Certainated Products Co., Second and Erie Streets, Philadelphia, manufacturer of roofing and kindred products, has plans for a one-story addition, 83 x 110 ft. Stofflet & Tillotson, Wesley Building, are architects.

A. H. Weldow, Widener Building, Philadelphia, has awarded a general contract to the Nelson Pedley Construction Co., 1510 Chestnut Street, for a four-story and basement automobile service, repair and garage building to cost about \$100,000.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: (43360) from Mez, Vater & Sohne, Freiburg, Baden, Germany, desirous of getting in contact with an American manufacturer in position to furnish a machine for stamping wooden spools, the machine to be so designed that removable numbers can be set in the punch, and also to be used for printing in two colors; (43366) from Santos Barreto & Hijos, 326 Avenida XVII, Guaymas, Mexico, desiring to get in touch with American manufacturers of button machinery; (43377) from S. Stern, 43 Frederiksborggade, Copenhagen, Denmark, desiring to get in contact with American manufacturers of machinery novel-

ties, automobile accessories, motorcycle accessories, etc.; (43358) from Gyula Bence, Engineer's Office, Csanad-Utca II, Budapest V, Hungary, operating a local consulting engineering business and repair shops, desiring to get in contact with American manufacturers of machine tools and other mechanical equipment for large mass production; (43369) from J. Ponce de Leon, Municipal Railways, Cali, Colombia, wishing to get in contact with American companies producing machinery for crushing corn, power-operated and of large capacity, also for grinding corn and coffee; and (43359) from the W. I. Patent Medicine Co., 22 Palmer's Park, Caguas, Porto Rico, wishing to get in touch with American manufacturers of machinery for taking fiber from coconut shells when dried.

The John E. Thropp Sons' Co., Lewis Street, Trenton, N. J., machinist, has plans for a one-story machine shop, 80 x 160 ft. W. E. S. Dyer, Broad Street Bank Building, is architect.

C. H. Conover, Freeman Building, Atlantic City, N. J., architect, has completed plans for a three-story automobile service, repair and garage building, 50 x 170 ft., to cost about \$75,000.

Fire, March 21, destroyed the machine and erecting shops of the Delaware & Hudson Railroad Co., at Carbon-dale, Pa., with loss of \$150,000 including equipment. Headquarters are at 32 Nassau Street, New York.

The plant of William T. Bate & Son, Conshohocken, Pa., manufacturers of iron and steel castings, machine equipment, etc., has been acquired by new interests headed by E. L. Gibbs and Thomas H. Nelson, both of Canton, Ohio, and A. E. Maskrey, Conshohocken. The new owners will operate under the name of William T. Bate & Son, Inc., and have plans for extensions and improvements, including the installation of an electric furnace and other equipment for the production of high grade alloy steels.

The Viscose Co. of America, Inc., Marcus Hook, Pa., is said to be planning for the construction of a power house addition in connection with a proposed extension in its artificial silk mill, estimated to cost \$3,000,000, of which about \$2,000,000 will be expended for machinery. The company will also build a similar addition, with like cost, at its plant at Roanoke, Va. The Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, is architect and engineer.

The American Nickeloid Co., Peru, Ill., is considering plans for an addition to its plant at Walnutport, Pa., with the installation of new machinery. James McCrindle is manager.

The Mummert-Dixon Co., Hanover, Pa., manufacturer of machinery and parts, has tentative plans for a one-story addition, 80 x 120 ft., to be used as a machine and pattern shop. E. S. Mummert is president.

Fire, March 20, destroyed a portion of the plant and equipment of the Hercules Metal Works Co., Catasauqua, Pa., with a loss of \$15,000. Plans for rebuilding are under way. J. Arthur Williams is general manager.

Fire recently destroyed the wood-working plant and equipment of the Steinhauer Co., Kingston, Pa., with a loss of \$150,000.

The H. Sofransky Co., Allentown, Pa., has purchased from the receivers the plant and equipment of the Lehigh Machine Co., Leighton, Pa., and the property with equipment will be sold in the near future.

The Alloy Metal Wire Co., Moore, Pa., is inquiring for an electric induction melting furnace of 500 lb. capacity.

Buffalo

BUFFALO, March 30.

PRELIMINARY plans are being considered by the Board of Education, Genesee Building, Buffalo, for an addition to public school No. 39, on High Street, for manual training, estimated to cost \$150,000.

The Wire Wheel Corporation of America, Inc., 1700 Elmwood Avenue, Buffalo, manufacturer of automobile wheels, is completing a drop-center metal rim for automobile tires and will develop a section of its plant for this line of production.

The Rand-Kardex Co., Inc., Tonawanda, N. Y., is being organized with a capital of \$10,050,000 to take over and consolidate the Rand Co., Inc., and the Kardex Co., both operating local plants for the manufacture of card-filing and kindred equipment. Extensions in manufacture are planned. James H. Rand, Sr., will be chairman of the board of the new organization, and James H. Rand, Jr., president and general manager.

Electric power equipment, conveying machinery, pumping equipment will be installed in the proposed new plant unit at Jacksonville, Tenn., to be erected by the du Pont Fibre Silk Co., River Road, Buffalo, to cost \$2,000,000 with equipment.

The Crane Market

PURCHASING of overhead and locomotive cranes is unusually light for this season, but there is a fair volume of inquiry in the market, more for the smaller types of overhead equipment than for some time. The Brooklyn-Manhattan Transit Co. in the market several months ago for four 1½-ton wall cranes and a 5-ton electric crane is reported to have revived the inquiry for new bids. Dwight P. Robinson & Co., New York, are the engineers on the work. The Interborough Rapid Transit Co. has asked for prices on six 1½-ton electric cranes. The Brooklyn Edison Co., Brooklyn, N. Y., is obtaining prices on five 5-ton and 10-ton hand crane power hoists for the generating station now being built. The West Virginia Pulp & Paper Co., 200 Fifth Avenue, New York, is in the market for two 15-ton electric hoists. The Pennsylvania Railroad, Philadelphia, has asked for prices on two 3-ton, 2-motor electric hoists for the Pitcairn shops. The General Electric Co., Schenectady, N. Y., is inquiring for a 10-ton, 37-ft. span, floor operated crane for Schenectady, in addition to the 10-ton crane for Cleveland, pending for several weeks. In the locomotive crane field, the inquiry of the Chile Exploration Co. is still pending. The Baltimore & Ohio Railroad, Baltimore, Md., is in the market for three 25-ton locomotive cranes.

Inquiry is active in the Pittsburgh district and there are expectations of further purchasing by the Carnegie Steel Co. for the Homestead and Mingo works. Among current inquiries are: Westinghouse Electric & Mfg. Co., a 5-ton trolley; Koppers Co., Pittsburgh, a 15-ton bucket handling crane for the new by-product coke plant of the Jones & Laughlin Steel Corporation at Woodlawn, Pa.; Imler Supply Co., Chestnut Street and Spring Garden Way, Pittsburgh, a 5-ton, 35-ft. span warehouse crane; United

Engineering & Foundry Co., Farmers Bank Building, Pittsburgh, a 7½-ton, 31-ft. 8-in. span crane for its Lincoln works roll shop; Diamond Alkali Co., First National Bank Building, Pittsburgh, a 30-ton, 38-ft. span, 1-motor power house crane for Painesville, Ohio.

In the Chicago district, the Chicago, Burlington & Quincy is inquiring for a 10-ton gantry crane for a new storehouse at Aurora, Ill., in addition to a previous inquiry for a 7½-ton overhead traveling crane.

Among recent purchases are:

Delaware & Hudson Railroad, Albany, N. Y., a standard ditcher from the American Hoist & Derrick Co., and a 10-ton, 4-wheel locomotive crane from the Brown Hoisting Machinery Co.

Southern Pacific Co., New York, a 40-ton locomotive crane from the Industrial Works.

Cincinnati, Indianapolis & Western Railroad, a crawler ditcher from the American Hoist & Derrick Co.

Baltimore & Ohio Railroad, Baltimore, Md., 12 electric hoists from the Shepard Electric Crane & Hoist Co.

Hudson Motor Co., Detroit, reported to have closed on a large list of electric hoists with the Shepard Electric Crane & Hoist Co.

Phoenix Utility Co., 71 Broadway, New York, a 100-ton power house crane for the Utah Power & Light Co., understood to have been purchased from the Whiting Corporation.

Chicago & Eastern Illinois, a 35-ton crane pile driver from the Industrial Works.

Atchison, Topeka & Santa Fe, a 25-ton locomotive crane from the Industrial Works.

The Board of Education, Mechanicsville, N. Y., is considering the installation of manual training equipment in a proposed four-story addition to the high school, to cost \$175,000, for which bids are being asked on a general contract. John T. Simpson, Essex Building, Newark, N. J., is architect.

The Board of Village Trustees, Kenmore, N. Y., is said to be planning the installation of pumping equipment in connection with proposed extensions in the water system, estimated to cost \$125,000.

The MacDonnell & Brannen Corporation, Bolivar, N. Y., operating a machine works, will establish a branch shop at Eldred, Pa.

The Buffalo Bolt Co., North Tonawanda, N. Y., manufacturer of bolts, nuts, wire and bar material, has just completed an addition, 75 x 80 ft., to its factory buildings to take care of the threading and milling of all jobbing orders. It is completely equipped with special machines to facilitate production.

Stanley Dubiel, 653 Hertel Street, Buffalo, N. Y., is in the market for a drill press, lathe and small tools, for a garage and service station under construction.

About \$30,000 worth of electrical conveying apparatus, motors and transmission equipment, will be required in connection with a new plant to cost \$90,000, for the Tribune-Times, Hornell, N. Y., for which a general contract has been awarded to Lee Dennison, Hornell.

The Washburn-Crosby Co., Minneapolis, Minn., has awarded a general contract to the Folwell Ahlskog Co., Chicago, for a 1,200,000 bu. capacity grain elevator at Buffalo, N. Y., for which electrical power machinery and other equipment will be required.

Detroit

DETROIT, March 30.

TENTATIVE plans are being considered by the Detroit Steel Corporation, 6189 Hamilton Avenue, for a one-story addition. Oscar Olson is vice-president and works manager.

The Pere Marquette Railroad Co., Grand Rapids, Mich., will make extensions in the engine house at the Wyoming yards, estimated to cost \$75,000 with equipment.

Dodge Brothers, Inc., 7900 Joseph Campau Avenue, Detroit, manufacturer of automobiles, is planning the erection of a light hammer shop.

The Detroit Edison Co., 2000 Second Avenue, Detroit, plans the construction of an automatic power substation on Beaubien Street, with initial capacity of 4600 kw. and ultimate output of 12,000 kw., estimated to cost \$1,100,000. It is also planning a similar substation on Cass Avenue, to cost

about \$500,000 with equipment, and for a new substation at Charlotte, with capacity of 7200 kw., to replace a former temporary plant, estimated to cost \$400,000.

The American Seating Co., Grand Rapids, Mich., plans the installation of an electric cupola charging device at its foundry, for handling scrap iron, coke, etc. Other equipment installations are also contemplated.

The Whitehead & Kales Co., Detroit, operating a general iron works at 2631 Beecher Street, is said to be planning the purchase of a 60-ton locomotive crane, with double hoisting drums and other equipment.

The Wynn Auto Sales Co., Sault Ste. Marie, Mich., is planning to purchase a drill press, lathe and other equipment.

The Brown Motor Truck Co., Lansing, Mich., recently organized, has leased space in the local plant of the Bates Tractor Co., and will manufacture heavy duty motor trucks and parts. It is headed by Leroy R. Brown, formerly superintendent at the plant of the Republic Motor Truck Co.

The Carle Machinery Co., 546 East Woodbridge Street, Detroit, recently incorporated, will buy, recondition and sell machine tools. It is in the market for high grade used machinery adaptable to automotive manufacturing. George R. Shuman, formerly at the Hamilton, Ohio, shop of the Niles Tool Co., and A. E. Carle, previously connected with the Bausch Machine Tool Co., Manning, Maxwell & Moore, and the Cadillac Tool Co., are associated in the business, which was established in 1921.

St. Louis

ST. LOUIS, March 30.

PLANs are being arranged by the Shawnee Copper Co., Eminence, Mo., for its proposed one-story mill and concentrating plant to cost \$100,000 with machinery.

The Board of Trustees, Bellefontaine Industrial Farm, St. Louis, is having plans drawn for a two-story addition for manual training work. L. R. Bowen, 301 City Hall, is architect and engineer.

The Russell Electric Car Co., 2310 Main Street, Kansas City, Mo., P. A. Russell, president, has plans for a two and three-story automobile service, repair and garage building, 70 x 220 ft., to cost \$80,000. Edgar C. Paris, 2838 Main Street, is architect.

The Oklahoma Gas & Electric Co., Oklahoma City, Okla., has arranged for a bond issue of \$3,000,000, a portion of the proceeds to be used for extensions and betterments. J. J. O'Brien is president.

The Mid-West Artistic Bronze Co., 906 North Market Street, St. Louis, recently organized, has arranged for a

new one-story foundry, 80 x 100 ft., for the production of bronze, brass and other metal castings. Charles C. Strotz is president.

The Common Council, Crane, Mo., is considering the installation of pumping machinery in connection with proposed waterworks extensions and improvements, for which it will soon ask bids. Charles A. Haskens, Kansas City, Mo., is architect and engineer.

Fire, March 21, destroyed a portion of the plant of the Quinton Smelter Co., Quinton, Okla., with loss estimated at \$70,000 with equipment. The main smelter, machine shops and dry kilns sustained the bulk of the damage. The plant will be rebuilt.

The New State Ice Co., Oklahoma City, Okla., will soon begin the erection of a one-story ice-manufacturing plant, 130 x 142 ft., to cost \$100,000 with equipment. Ophuls & Hill, Inc., 112 West Forty-second Street, New York, is architect and engineer. Carl S. Glitsch is vice-president.

Fire, March 24, destroyed a mill at the plant of the Keiser Cooperage Co., Keiser, Ark., with loss reported at \$300,000 including machinery. It is planned to rebuild.

The Marland Refining Co., Ponca City, Okla., is planning the construction of a two-story and basement addition, 60 x 115 ft., at its local oil works, to cost \$100,000 with equipment. A portion of the structure will be used for a laboratory.

The Eskimo Refrigerator Co., St. Louis, has leased a building at 1525-27 North Fourteenth Street, and will operate for the manufacture of refrigerators and refrigerating equipment.

The Board of Aldermen, Fayetteville, Ark., is considering a bond issue of \$200,000 for a municipal electric power plant. It is purposed either to purchase an existing power station and remodel or to build a new plant.

C. A. Cunningham, Blytheville, Ark., is in the market for 5000 ft. of 75 lb. steel rails.

Chicago

CHICAGO, March 30.

A NUMBER of fresh railroad inquiries have appeared, the largest of which is a list of 53 items issued by the Chicago, Burlington & Quincy. The Chicago Union Station Co. is in the market for nine machine tools for its repair shops and the New York Central has put out inquiries for five items. Six additional inquiries have been issued by the Santa Fe. The trade finds encouragement in the large amount of railroad business pending, although the market is otherwise quiet and actual bookings during the week have been few. In fact, total orders for the month of March probably do not aggregate more than two-thirds of those for February, which in turn was not as good a month as January. The Burlington has closed for an axle lathe for Alliance, Neb., having placed this tool before issuing its extended list. The Nash Motors Co. has placed orders for six additional spindles of upright drills.

Chicago Union Station Co.

All tools to be motor driven.
One 18-in. x 10-ft. geared head engine lathe.
One 20-in. back geared shaper.
One high-speed pedestal type sensitive drill with $\frac{3}{8}$ -in. capacity.
One 6 x 6-in. hack saw.
One blacksmith's forge similar to Champion No. 440.
One 20-in. sliding head upright drill.
One grinder with 12 x 2-in. wheels.
One grinder with 8 x $\frac{3}{4}$ -in. wheels.
One $1\frac{1}{4}$ x 6-in. pipe machine.

New York Central Lines

Two 20-in. engine lathes.
One 6-ft. radial drill.
One universal cutter grinder.
One 500-ton hydraulic wheel press.

Atchison, Topeka & Santa Fe

All tools to be motor driven except where otherwise specified.
One Boye & Emmes, or equivalent, 16-in. x 10-ft. heavy-duty engine lathe.
One 20-in. x 8-ft. heavy-duty Hendey, or equivalent, engine lathe.
One $2\frac{1}{2}$ -in. Landis, or equivalent, double head heavy duty belt-driven bolt cutter.
One 54-in. vertical heavy-duty boring mill.
One 2-in. Landis, or equivalent, bolt cutter.
One Lucas, or equivalent, 50-ton driving box press.

Chicago, Burlington & Quincy

All tools to be motor driven except where otherwise specified.

One 16-in. geared head engine lathe, 48 in. between centers.

Two 18-in. geared head engine lathes, 48 in. between centers.

One belt-driven double end car axle lathe, swing over bed $27\frac{1}{2}$ in., over carriage $13\frac{1}{4}$ in., distance between centers 9 ft.

One 48 x 48-in. x 18-ft. planer with two heads on cross rails and two side heads equipped with variable speed reversing motor direct connected.

One 36-in. heavy duty shaper.

One horizontal boring mill with one 3-in. and one 4-in. boring bar, 120 in. between face plate and arbor support, equipped with 16-in. face milling cutter.

Two belt-driven car wheel boring mills with 54-in. diameter table to take wheels up to 48 in. in diameter.

One 54-in. adjustable rotary milling machine with two sets of ways at right angles, 40 x 46 in. over the shears.

One 20-in. upright drill, $1\frac{1}{4}$ -in. capacity, with automatic feed.

One 26-in. upright drill, 2-in. capacity, with automatic feed.

Two pneumatic flanging machines for flanging sheets up to and including $\frac{3}{4}$ in. thick.

One bending machine for bending square bars, $1\frac{1}{4}$ in. capacity.

One 400-ton belt-driven hydraulic horizontal type wheel press.

One 24-in. geared head engine lathe, 72 in. between centers, arranged for motor belt drive.

One 16-in. portable engine lathe, 36-in. between centers, arranged for motor belt drive.

One 20-in. geared head turret lathe, arranged for motor belt drive.

One 32-in. heavy pattern back geared crank shaper.

One heavy duty upright drill, capacity to drill 3-in. hole in solid steel, distance from center of spindle to face of column $12\frac{1}{4}$ in., distance from end of spindle to compound table 38 in., arranged for motor belt drive.

One heavy duty upright drill, to drill 4-in. hole in solid steel, distance from center of spindle to face of column 18 in., distance from end of spindle to compound table 38 in., arranged for motor belt drive.

Three belt-driven 20-in. upright drills.

One heavy duty single spindle drill, capacity $1\frac{1}{2}$ -in. in solid steel.

One 72-in. radial drill, arranged for motor belt drive.

One double spindle drill, capacity $\frac{3}{4}$ -in. in solid steel.

One heavy-duty radius internal surface grinder, arranged for motor belt drive.

One Acme, or equivalent, six-spindle cock grinding machine for grinding $1\frac{1}{4}$ -in. angle cocks and 2-in. stop cocks.

One pedestal double-end spindle grinder with 20 x 3-in. wheels.

One wet tool grinder with 24 x 3-in. wheel for grinding lathe, planer and shaper tools.

One motor-belt driven National, or equivalent, die grinder for grinding bolt cutters.

One Heald, or equivalent, No. 50 internal grinder, arranged for motor belt drive.

One Dumore No. 3, or equivalent, grinder.

Five 6-in. x 6-in. high speed hack saws.

One 36-in. foot power squaring shear, capacity No. 18 gage sheet.

One 200-lb. Bradley hammer.

One belt-driven pipe threading machine, $\frac{3}{4}$ to 3 in., equipped with two sets of chasers.

One double-head bolt cutter.

One $3\frac{1}{2}$ -in. x 6-ft. portable boring bar and equipment for cylinder and valve bushings to bore cylinder from 8 to 20 in. in diameter.

One $4\frac{1}{2}$ -in. x 6-ft. portable boring bar and equipment for cylinder and valve bushings, to bore cylinders and valves from 16 to 36 in. in diameter.

One car axle journal lathe for turning outside journals $6\frac{1}{2}$ x 12 in. to $3\frac{3}{4}$ x 7 in., swing over bed 41 in., distance between centers 9 ft. 1 in.

One heavy-duty coach wheel lathe to swing 52 in. over bed, to take 6 x 11-in. axle, to be equipped with crane.

One 90-in. heavy duty driving wheel lathe, to swing 84 in., 9 ft. 2 in. between face plates.

One straight-sided steel tied frame geared press, 6-in. stroke, capacity on slide for holding punch shanks, to deliver 125 lb. pressure at end of stroke.

One 75-ton rod press.

One 2-in. forging and upsetting machine.

One multiple punch, 84 in. between housings, depth of throat from center of ram to housing 12 in., vertical die space with the ram down 17 in.

The W. H. Barber Co., manufacturer of naval stores, 3650 South Homan Avenue, Chicago, has had plans drawn by E. G. McClellan, 7439 Cottage Grove Avenue, for a one-story factory, 60 x 113 ft., to cost \$35,000.

Contract has been awarded to the Dahl-Stedman Co., Chicago, for a one-story power plant for St. Luke's Hospital, Chicago, to cost \$100,000.

William Schukraft & Sons, 943 Fulton Street, Chicago, are taking bids through Emil H. Fromann, 64 West Randolph Street, Chicago, on a three-story automobile body shop, 140 x 200 ft., corner of Washington Boulevard and Ann Street, to cost \$300,000.

O. K. Colby, 1639 East Seventy-ninth Street, Chicago, has placed contract for a one-story machine shop, 50 x 75 ft., at 7138-44 Stony Island Avenue, to cost \$6,000.

The C. H. Stoelting Co., 3047 Carroll Avenue, Chicago, manufacturer of scientific apparatus, has awarded contract for a one-story factory, 120 x 121 ft., at 418-28 North Homan Avenue, to cost \$53,000.

The Sellers Mfg. Co., 4651 Pensacola Avenue, Chicago, manufacturer of the plates, has awarded contract for a one-story rolling mill, 85 x 160 ft., to cost \$30,000.

G. B. Ackerman, 1516 North Menard Avenue, Chicago, has awarded contract for a one-story tin shop, 48 x 124 ft., 1428-30 North Kilpatrick Avenue, to cost \$10,000.

The Van Schaack Brothers Chemical Works, 3358 Avondale Avenue, Chicago, will construct a two-story machine shop, 28 x 50 ft., at 3414 Henderson Street, to cost \$8,000.

The Yellowstone Park Transportation Co., Yellowstone Park, has started work on a machine shop to cost \$150,000. It is being erected primarily as a service station for the fleet of buses operated by the company, but it will also take care of repairs for automobile tourists in the park.

The Illinois Glass Co., Broadway and Washington Streets, Alton, Ill., plans the construction of a power plant addition in connection with factory extensions, estimated to cost \$500,000. The Jackson & Morehead Co., 31 St. James Avenue, Boston, is architect and engineer. William E. Lewis is president.

The Board of Education, Culbertson, Neb., is considering the installation of a manual training department in its proposed two-story high school to cost \$115,000, for which bids will soon be asked on a general contract. Marcus L. Evans, Brandes Building, Hastings, Neb., is architect.

The Acme Steel Goods Co., Riverdale, Ill., is having plans drawn at the office of the McClintic-Marshall Co., 28 South Dearborn Street, Chicago, for a new hot strip mill addition to cost in excess of \$200,000.

The Intersectional Realty Co., 816 Second Avenue, South, Minneapolis, Minn., is having plans drawn for a one-story electric light and power house at Twelfth and Marquette Streets to cost \$100,000. Larson & MacLaren are company architects and engineers.

The Knife River Coal Co., Beulah, N. D., is planning the construction of a steam-operated power house. A new steel tippie will also be built. The work will cost approximately \$60,000.

The John A. Holmes Mfg. Co., 69 Twelfth Street, South, Minneapolis, Minn., manufacturer of wood boxes and containers, is said to be arranging to rebuild the portion of its plant recently destroyed by fire, with loss of about \$50,000 including equipment.

The City Council, Buhl, Minn., is planning for a bond issue of \$100,000, the proceeds to be used for a municipal electric light and power plant.

The Jordan Machine Tool Co., 1854 East Twenty-eighth Street, Minneapolis, Minn., will soon take bids on a general contract for a one-story plant, 70 x 110 ft.

The Consumers Steel Co., 190 North State Street, Chicago, will buy surplus steel, especially cold and hot-rolled strip sheets and bars, in salable condition.

Indiana

INDIANAPOLIS, March 30.

CONTRACT has been let by the Trainor National Spring Co., New Castle, Ind., manufacturer of steel springs, to the Austin Co., for a one-story plant unit, 80 x 240 ft., in which complete new equipment will be installed.

The Tokheim Oil Tank & Pump Co., Fort Wayne, Ind., has awarded a general contract to Olds Brothers, First National Bank Building, for a one-story addition, 50 x 195 ft., to cost \$32,000.

The Edle Battery Co., 25 West Eleventh Street, Indianapolis, is planning for enlargements and the installation of additional equipment.

The Board of School Commissioners, 150 North Meridian Street, Indianapolis, will install shops for vocational training in the proposed two-story and basement high school for colored students at Twelfth and West Streets, estimated to cost \$550,000, for which bids will be asked soon on a gen-

eral contract. Harrison & Turnock, Board of Trade Building, are architects. It is also planned to install manual training equipment in the proposed Shortridge high school on Thirty-fourth Street, estimated to cost \$1,500,000, for which preliminary plans are being prepared by J. Edwin Kopf and Woolling, Indiana Pythian Building, architects.

The Hoover-Bowers Co., Inc., Indianapolis, recently organized, will operate an automobile service, repair and garage building, with complete machine shop, at 3220 East Michigan Street. Existing property will be taken over and extensions made.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has filed plans for a factory branch and distributing works at Pratt Street and Senate Avenue, Indianapolis, two-stories, 160 x 300 ft., to cost \$160,000. The Hunting-Davis Co., Century Building, Pittsburgh, is architect.

The Southern Railway Co., Washington, has tentative plans for rebuilding its car and locomotive repair shops at Princeton, Ind., destroyed by a tornado March 18, with loss estimated at \$1,000,000 including equipment.

The Standard Chair Mfg. Co., Cambridge City, Ind., will begin the erection of a one-story addition to cost about \$60,000 with equipment.

The Board of Education, Portland, Ind., is considering the installation of manual training equipment in a proposed two-story and basement high school to cost \$140,000, for which bids have been asked on a general contract. Walter Scholer, Painters' and Decorators' Building, Lafayette, Ind., is architect.

New England

Boston, March 30.

ALTHOUGH sales of machine tools in this territory the past week have been few and March has been one of the leanest months in the trade during the past two or three years, sentiment is more optimistic due to a slight increase in the number of new prospects. Most of the inquiries still call for single machines, but prices have been asked by a New England shipyard on six or seven sizable machines, including a 72-in. lathe, and two inquiries are out for 60-in. boring mills. One of the railroads is in the market for a heavy-duty milling machine. The New York, New Haven & Hartford recently purchased a horizontal boring machine. Another road, while not out with an inquiry, gives indication of being in the market before long for several pieces of shop equipment.

Small tool business has dropped off materially and March sales probably will be the smallest for any month this year. The falling off in the demand is attributed to a slowing down by some metal-working shops heretofore moderately active. One of the largest railroad shops on a six-day schedule, will start this week on five days.

The Massachusetts Lighting Co., 77 Franklin Street, Boston, has awarded contract for rebuilding its North Adams gas plant. The company's engineer is in charge of the work.

Contract has been awarded by the Narragansett Electric Light Co., Providence, R. I., for the erection of a turbine hall extension. Jenks & Ballou, 10 Weybosset Street, Providence, are the engineers.

Bigelow & Wadsworth, 3 Hamilton Place, Boston, are the architects and Whidden Beekman Engineering Co., 100 Boylston Street, engineers, for a substation to be erected on Canton Street, by the Edison Electric Illuminating Co. of Boston, 39 Boylston Street. It will be five stories and cost approximately \$100,000.

Fire, March 22, destroyed a portion of the ice-manufacturing plant of the Commonwealth Ice Co., Shrewsbury, Mass., with loss estimated at \$50,000 including equipment. It is planned to rebuild.

The Bureau of Supplies and Accounts, Navy Department, Washington, is asking bids until April 14 for 12,000 ft. admiralty metal tubing for the Portsmouth yard, and 50,000 admiralty metal condenser tubes for Mare Island, schedule 2505; until April 7 for a quantity of corrosion resisting bar steel for the Portsmouth yard, schedule 2509.

A pumping plant for sewage service will be constructed by the Fifth School District, East Bristol, Conn., in connection with a proposed school estimated to cost \$160,000. Harold A. Hayden, Bristol, Conn., is architect.

The Automatic Package Machinery Co., Nashua, N. H., recently organized, has arranged for initial production at the plant of the Flather Mfg. Co., 50 Spring Street, occupying a portion of the works. It is said that later an individual plant will be established. Edwin Morey is president, and Donald MacNaughton, vice-president and secretary.

The Crystal Ice Co., Norwalk, Conn., is said to be planning the early purchase of ice-manufacturing and refrigerating machinery for installation in an addition.

The United Smelting & Aluminum Co., Edmond Street, Hamden, Conn., has awarded a general contract to Louis Egger, 17 White Street, for a one-story addition, 110 x 140 ft.

The Noyes-Buick Co., 857 Commonwealth Avenue, Allston, Boston, local representative for the Buick automobile, has plans for a one and two-story service, repair and garage building at Springfield, Mass., to cost approximately \$45,000.

Canbec, Inc., 309 Industrial Trust Building, Providence, R. I., has been organized to manufacture fire extinguishers. The interests involved operated as the Canbec Sales Co., at Attleboro, Mass., and Providence, manufacturing fire extinguishers and operating a department in tool and small machine work. Both branches expanded so rapidly it was thought best to separate, the Canbec Sales Co. operating in the tool and machine work and Canbec, Inc., manufacturing the other products. The company will be in the market for materials and also will have some work to be done under contract. No awards have been made. R. M. Henshaw is one of the principals.

Pittsburgh

PITTSBURGH, March 30.

MARCH has been only a fair month in the local machinery trade, not through any lack of inquiry, but because buyers have been slow to close. Orders against some good sized inquiries put out some time ago have reflected revisions of requirements. The trade seems to have passed from a condition of cheerful expectancy into one of doubt as to the immediate future. Standard tools cannot be sold as freely as in former years nor in keeping with existing productive capacity. The trend is still strongly toward special adaptations of standard tools and as machines now are built in accordance with the work to be performed, quantity production is hampered. An inquiry listing 19 items from the Virginian Railway for Mullens, W. Va., is the outstanding one of the past week.

Plans are being considered by the Bradford Supply Co., Main Street, Bradford, Pa., for a one-story machine shop at Eldred, Pa., to cost \$25,000 with equipment. R. A. Mackie is general manager.

The Transcontinental Oil Co., Benedum Trees Building, Pittsburgh, operating oil refineries and oil-well properties, is disposing of a note issue of \$4,000,000, a portion of the proceeds to be used for extensions and improvements. F. B. Parriott is president.

The Allegheny River Sand & Gravel Co., Pittsburgh, Pa., recently organized, will establish a sand and gravel handling plant in the vicinity of Oil City, Pa., where operations will be conducted on the Allegheny River. A steel river fleet to cost about \$50,000 will be built, including dredger, barges, etc. Captain John H. Hudson, Pittsburgh, is president; Clark J. McKee, Dormont, Pa., is treasurer.

The Worthington Pump & Machinery Corporation, Oliver Building, Pittsburgh, has awarded a general contract to the Thomas Coutts Co., 3320 Smallman Street, for a two-story and basement building at its plant at Water and Forty-third Streets, 50 x 65 ft.

The Bertha-Consumers Coal Co., Chamber of Commerce Building, Pittsburgh, will rebuild the portion of its mining plant at Randall, near Fairmont, W. Va., recently destroyed by fire, with loss estimated at \$50,000 including equipment.

Schnucke & Bocker, Woolworth Building, Greensburg, Pa., architects, are completing plans for a two-story automobile service, repair and garage building, 80 x 87 ft., at Irwin, Pa., estimated to cost \$42,000.

Manual training equipment will be installed in the three-story senior high school to be erected on Washington Street, Charleston, W. Va., estimated to cost \$900,000, by the Charleston Independent School District.

Warne, Tucker & Patterson, Masonic Temple Building, are architects.

The Pittsburgh & Lake Erie Railroad Co., Pittsburgh, has awarded a general contract to Walker & Curley, Sharpsburg, Pa., for the erection of its proposed engine house, with repair facilities, at McKees Rocks, Pa.

The Ohio Valley Sand Co., New Martinsville, W. Va., is considering the purchase of a gasoline hoist, with 1 yd. capacity bucket.

The Hope Natural Gas Co., Charleston, W. Va., operated by the Standard Oil Co., 26 Broadway, New York, is said to be completing plans for the construction of a pipe line about 100 miles long, including pressure stations, etc.

Cincinnati

CINCINNATI, March 30.

PRODUCTION of machine tools continues at a fair rate with conditions somewhat spotty. Only a limited number of orders were placed the past week, but inquiries are brisk and manufacturers are hopeful that a satisfactory portion will materialize in orders. An encouraging feature of the market is the amount of foreign business being placed locally. Several plants are now working on machines for delivery to Russia, Italy and South Africa. One machine tool builder received an order for several machines for South America during the past week. Automobile manufacturers are buying but little at present and railroads are purchasing tools conservatively.

Lathe manufacturers state that business is on the up-grade. One plant sold four large lathes the past week to the New York Central Railroad. Planers are in fair demand and manufacturers report inquiries are encouraging. Production of milling machines is going ahead at a gratifying pace, although several small concerns say business is dull. Shaper manufacturers are pleased with the outlook, although the volume of sales has been restricted. Radial and upright drills are in fairly good demand. Sellers of used machinery report that sales have increased in the past two weeks. Machinery dealers find sales only fair.

The new engine terminal of the Chesapeake & Ohio Railroad Co. at Russell, Ky., will include a 14-stall engine house, machine shop, power house, and other buildings, with a 115-ft. turntable, conveying and handling apparatus. C. W. Johns, Loanoke, is chief engineer.

The Darb Fork Coal Co., Hazard, Ky., is electrifying its entire mine on Lott's Creek, near Hazard.

The Dayton Power & Light Co., Dayton, Ohio, subsidiary of the Columbia Gas & Electric Co., will begin shortly the construction of a new high tension transmission line from Washington Court House and Wilmington, Ohio.

The Procter & Gamble Co., Cincinnati, is in the market for two oil tanks, one 29 ft. high and the other 70 ft.

The Greenville Gravel Co., Greenville, Ohio, has acquired property near Greenlawn Avenue, Columbus, Ohio, and plans the construction of a gravel washing, screening and crushing plant to cost approximately \$200,000, with machinery.

Merrill B. Parker, 1912 Oak Street, Chattanooga, Tenn., engineer, is in the market for an electric traveling crane, 60-ft. span, d.c. motors, complete with runway, etc.

The Elkhorn Collieries Co., Thornton, Ky., will rebuild its tippie and power house at Bastin, Ky., recently destroyed by fire. The new structures will cost \$100,000 with machinery.

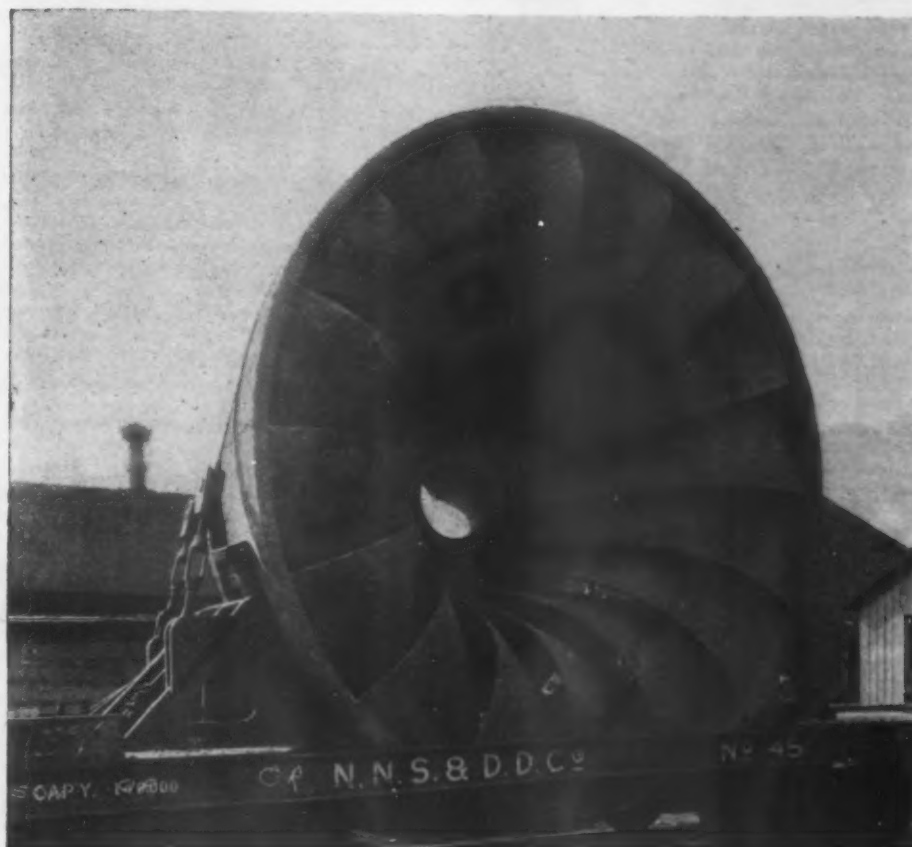
J. C. Ford, 48 South Front Street, Memphis, Tenn., is desirous of getting in contact with a plant in position to manufacture a device for attaching to automobiles.

The Dayton Fire Door Co., 415 West Fifth Street, Dayton, Ohio, manufacturer of kalamein and tin-clad fire doors, etc., is arranging for the early removal of its plant to the Norwood Power Building where larger space has been secured.

The Hoffman Heater Co., 1705 South Eighteenth Street, Louisville, is completing plans for a new factory to cost \$70,000 with equipment.

The White Motor Co., Nashville, Tenn., with headquarters at Cleveland, has leased a local building to be erected by Norman Kirkman, Belmont Building, for a service and repair works and garage, estimated to cost \$45,000.

E. W. Cooper, 174 Third Street, Nashville, Tenn., engineer, has inquiries out for a gyratory rock crusher, Austin type preferred.



THE turbine runner herewith pictured is one of four that is being furnished by the Wheeling Mold & Foundry Co., Wheeling, W. Va., for the Wilson Dam development at Muscle Shoals. It is a one-piece steel casting weighing approximately 134,000 lb. with an outside diameter of 15 ft. 6 in., 9 ft. 6 in. in depth and when placed on the car for shipment it towered 16 ft. 10 in. above the rail. Before leaving, the foundry made the drastic test of striking the thin inside blades with a heavy sledge without causing a crack or permanent deflection.

The railroad car built for the purpose left the Wheeling plant March 10, and Pittsburgh two days later. It went around Philadelphia to Cape Charles, Va. It was ferried to Newport News, Va., arriving March 18 at the plant of the Newport News Shipbuilding & Dry Dock Co., where it is to be machined.

The Casey Boiler Works, Springfield, Ohio, is in the market for a used bending roll, $\frac{1}{4}$ -in. capacity, 5 or 6 ft. between housings.

The Tennessee-Colorado Marble Co., Knoxville, Tenn., is in the market for grinding, polishing and beveling machinery for installation in a proposed addition.

An auction sale of machine tools and other equipment of the Davis Sewing Machine Co., Dayton, Ohio, will be held at the plant, Davis and Linden Avenues, Dayton, on April 14, 15 and 16 by Samuel T. Freeman & Co., auctioneers, 1808 Chestnut Street, Philadelphia. More than 900 machine tools will be offered for sale.

The Louisville Tin & Stove Co., Louisville, Ky., is in the market for a 6-ft. brake.

Milwaukee

MILWAUKEE, March 30.

ONLY a moderate volume of machine tool business, mainly in single items, is passing. Inquiry is fairly active. Locally, industrial construction has not yet assumed its usual spring-time upward swing, which always calls for considerable equipment. Foundries and machine shops, however, are improving their position, although this means merely approaching capacity limits rather than expanding. Used tool offerings are more plentiful, with no noticeable increase in the call.

The Onida Mfg. Co., Green Bay, Wis., which 18 months ago took over the factory and equipment of the former Onida Motor Truck Co., and has been building railroad coaches with gasoline motive power, has now been acquired by the Railway Motors Corporation, 247 Railway Exchange Building, Chicago, a new Delaware concern with \$1,000,000 capital. L. W. Melcher, president and general manager of the Onida company, is associated in the newer enterprise with R. E. Frame, treasurer Central Brake Shoe & Foundry Co., Chicago; A. C. Deverall, formerly general superintendent motive power, Great Northern Railway; A. A. Aggerbeck, Chicago and Boston; J. H. Taylor, president McCartney National Bank, Green Bay, and others. The Green Bay plant will be used to manufacture the power units, and other plants are to be established

in various districts. Production at Green Bay is to be materially advanced June 1. This will require only unimportant additions to equipment for the present.

The Wisconsin Gasoline Railway Equipment Co., organized recently at Oshkosh, Wis., with \$150,000 capital stock, has contracted with the Wisconsin Parts Co., Oshkosh, automobile and truck axles, units and parts, for materials and assembling processes, pending the erection of its own plant later. G. S. Cromwell is chief engineer and other principals are O. E. Woodcock, R. G. Aeder and Earl Woodcock.

Lindsay Brothers, Inc., 78-94 Reed Street, Milwaukee, owner of the building at 60-76 Reed Street, occupied for the most part by the Modern Grinder Mfg. Co., and badly damaged by fire several weeks ago, will rebuild a three-story section, 65 x 135 ft., for the company. Most of the machinery was badly damaged and will require replacement. Ely Bockshe is president and general manager.

J. G. Holmquist, formerly of Chicago, has leased a factory at Burlington, Wis., and will install complete equipment for the manufacture of adjustable metal frames. The business will be operated as the Holmquist Curtain Stretcher Co., and is expected to get under way about June 1.

The Manawa, Wis., Village Board will close bids April 15 for the construction of a municipal waterworks system with 10,000 lin. ft. of cast iron mains. Two 500-hp. centrifugal pumps direct connected to a 220-volt electric motor with manual control are included in the auxiliaries on which bids are being taken. J. C. Kinsman is village clerk.

The Clark Motor Co., 456-460 Jackson Street, Milwaukee, distributor of Chrysler and Maxwell automobiles, let the general contract to the Immet Construction Co., Fond du Lac, Wis., for its new sales and service building, 100 x 115 ft., three stories and part basement. It is to be ready about June 15 and will cost about \$125,000 with equipment. The architects are Buemming & Guth, local. George W. Browne is general manager.

The Racine, Wis., Board of Education has engaged Perkins, Fellows & Hamilton, architects, 314 Tower Court, Chicago, to prepare designs for the proposed new high school to be erected in units costing from \$650,000 to \$750,000 each. Details will be available about April 15. Construction work will be started so that the building will be ready about Sept. 1. Frank Schaefer is secretary of the board.

Cleveland

CLEVELAND, March 30.

ORDERS and inquiries have been less numerous the past week with local dealers than earlier in the month, but some machine-tool manufacturers report a satisfactory volume of bookings and considerable gain in business in March over February. Demand from the automotive industry continues quiet, but the trade is looking for some good business from Dodge Brothers. This plant, according to reports, will make changes in some of its production methods that will require the purchase of considerable equipment.

A local manufacturer of turret lathes has taken an order from the Edwardsville Brass Co., Edwardsville, Ind., for four machines and from a Pittsburgh district manufacturer for four large turret lathes. The American Steel & Wire Co. has purchased a 6-ft. radial drill. The New York Central Railroad is inquiring for two 20-in. lathes, one 6-ft. radial drill, one universal cutter grinder and one 500-ton hydraulic wheel press for one of its Eastern shops.

The Bryant Heater & Mfg. Co., Cleveland, has placed a general contract with the deHamel Construction Co., Plymouth Building, for its new plant which will include a two-story and basement office building, 33 x 148 ft., and a one-story factory, 150 x 300 ft.

The Kline Spring Co., Cleveland, has awarded a general contract to the Charles Peterson Co. for a one-story factory, 50 x 100 ft.

The Star Machine & Tool Co., 6505 Carnegie Avenue, Cleveland, is taking bids for a one-story with part basement machine shop on Woodland Avenue, near East Ninety-third Street. J. J. Schurger is president.

The Columbian Hardware Co., Cleveland, has taken bids for a two-story and basement factory, 90 x 120 ft.

The Beans Foundry Co., Martins Ferry, Ohio, has taken bids for a foundry, 100 x 100 ft. The J. E. Moss Iron Works, Wheeling, W. Va., was low bidder for the steel work.

The Board of County Commissioners of Lake County, Painesville, Ohio, has received bids for a sewage disposal plant and ejector station at Mentor Headlands. Duplex ejector pumps will be required.

Manual training departments will be established in the high schools to be built in Columbus, Ohio, E. L. McCune, clerk of the Board of Education, and in Ashland, Ohio, John Grindell, clerk of the Board of Education.

The plant of the Wyandot Burial Vaults Co., Upper Sandusky, Ohio, manufacturer of steel burial vaults, etc., was destroyed by fire March 24 with loss of \$100,000.

The Forest City Structural Steel Co., Cleveland, has been incorporated to fabricate and erect structural steel and has purchased the plant which has been operated for a number of years by the Forest City Steel & Iron Co. J. H. Lesh, formerly vice-president of the Riverside Bridge Co., Martins Ferry, Ohio, is the organizer and president of the new company. Other officers have not been elected.

The Gulf States

BIRMINGHAM, March 30.

THE Equitable Equipment Co., New Orleans, machinery dealer, has inquiries out for one or two electric generator sets, 75 to 100 kw., three-phase, 60-cycle, 2300 volts, direct-connected to steam engine; also for an exciter, switchboard and accessory equipment.

The McLain Hoe Service Co., Shreveport, La., has plans for a new factory for the manufacture of circular saws and accessory equipment. The initial works will approximate 3500 sq. ft.

The Thompson Ice Co., Key West, Fla., will build an addition to its plant to cost \$80,000 with equipment.

The McKinney Cotton Mill Co., McKinney, Tex., now being organized, plans the construction of a power house at its proposed cotton mill estimated to cost \$400,000. Dr. C. G. Comegys, John H. Fergusson and T. E. Craig head the company.

Fire, March 18, destroyed the planing mill and plant of the Handbury Lumber Co., Inverness, Fla., with loss estimated at \$100,000. It is planned to rebuild.

The United States Gypsum Co., 205 West Monroe Street, Chicago, is planning for an addition to its factory at Sweetwater, Tex., to double, approximately, the present output, estimated to cost \$250,000 with machinery. The company recently completed an extension to the plant.

The McKinney Ice & Coal Co., McKinney, Tex., will erect

an addition to its ice-manufacturing and cold storage plant to double the present capacity. It will cost about \$50,000 with equipment. Thomas E. Craig is general manager.

The United States Engineer, Jacksonville, Fla., will take bids until April 11 for one 12-in. riveted shore discharge pipe elbow for the hydraulic dredge Congaree, circular 81.

The San Antonio Public Service Co., North Street, San Antonio, Tex., plans the construction of a new electric generating station on the Guadalupe River, near New Braunfels, Tex., to cost \$2,500,000 with equipment. A transmission line will be built.

The Board of Education, Clearwater, Tex., plans the installation of manual training equipment in its proposed junior high school estimated to cost \$130,000, for which bids have been asked on a general contract.

The Howell Lumber Co., Bryan, Tex., E. S. Howell, president, will build its wood-working mill and other departments and install additional machinery. The plant was recently damaged by fire with loss of about \$50,000. E. S. Howell is president.

W. M. Smith & Co., First Avenue, Birmingham machinery dealer, has inquiries out for a mushroom type magnet, also a number of sets of large reduction gears.

J. H. Dore, 1203 Oakdale Street, Houston, Tex., has plans for a one-story foundry, 75 x 200 ft., estimated to cost \$45,000.

The Independent Ice Co., 1628 South Avenue, Shreveport, La., will build a one-story addition to its ice-manufacturing plant to cost about \$30,000 with equipment.

The Burton-Swartz Cypress Co. of Florida, Perry, Fla., is in the market for 50 to 100 heavy section used channels, 20 to 22 ft. in length and 10 to 14 in. in width.

South Atlantic States

BALTIMORE, March 30.

HOWARD M. ADDISON, 3135 North Calvert Street, Baltimore, and associates are said to have closed negotiations for the purchase of the plant of the Spedden Shipbuilding Co., Kenwood Street. The new owners will continue the plant, with improvements and extensions, operating under the name of the Spedden Shipbuilding Corporation, of which Mr. Addison will be president.

Electric power equipment, conveying apparatus, transmission and other machinery will be installed in the two-story and basement meat-packing plant to be erected on Sixth Street, Baltimore, by Louis H. Rettberg, Inc., 2823 Pennsylvania Avenue, to cost \$200,000. Standler, Levine & Craven, 50 Church Street, N. Y., are architects and engineers.

The purchasing agent, Bureau of Engraving and Printing, Washington, will receive bids until April 10 for two motor-driven duplex milling machines.

The Avalon Concrete Brick, Block & Products Co., 505 West Redwood Street, Baltimore, has plans for new works on the Philadelphia Road, with initial equipment to handle about 100 tons of raw materials per day. It will purchase a steam shovel, power-operated brick and block molding machinery and auxiliary equipment. H. L. Thomas is president.

The Virginia Portland Cement Co., National Bank of Commerce Building, Norfolk, Va., is said to have arranged a fund of about \$1,450,000 for an expansion program at South Norfolk, to include additional units and machinery. E. J. Possett is vice-president.

The Director of Public Utilities, Richmond, Va., is asking bids until April 7 for one water-gas generating set and waste heat boiler with accessories, for the municipal gas works, as per specifications.

R. I. Dalton and W. B. Hodge, 201 Hawthorne Lane, Charlotte, N. C., are forming a company to take over the plant and business of the Southern Ice Machine Co., manufacturer of ice-making machinery and parts. The new owners contemplate extensions.

The La Grange Iron Works, La Grange, Ga., is said to be planning the purchase of a quantity of gear cutters and other equipment. R. J. Higginbotham is secretary.

The Herfurth Engine & Machinery Co., Camden, S. C., has inquiries out for a mechanical air blower, belt-driven or direct-connected to motor.

The Portsmouth Oxygen Corporation, Portsmouth, Va., recently organized, will erect a new plant on the Belt Line Railroad for the manufacture of commercial oxygen and kindred products. A department will be established for welding, cutting and kindred operations. Louis Rosenstein is president.

The Board of Aldermen, Anderson, N. C., is arranging a bond issue of \$50,000, the proceeds to be used for a proposed municipal electric light and power plant.

The general purchasing officer, Panama Canal, Washington, will take bids until April 8 for six portable riveting forges, 480 machine chisels, 44 pressure gages, circular 2379; until April 21 for molding machine, steel pipe, boiler tubes, hacksaw blades, boiler punches, files, turnbuckles, tape, stocks, dies, reamers, twist drills, bits, wire cloth, scales, pumps, welding wire, shackles, cable clips, etc., circular 1662.

M. W. Vicars, mayor, town of Wise, Va., will receive bids until April 8 for equipment for a proposed municipal waterworks, including two 500-gal. per min. centrifugal pumps; two 50-hp. electric motors; one 60-gal. per min. deep-well pump; one 10-gal. per min. centrifugal pump; one 10-hp. motor; valves, gages, controllers, etc. The J. B. McCrary Engineering Corporation, Atlanta, Ga., is engineer.

The Sinclair Refining Co., 45 Nassau Street, New York, has taken over about 15 acres at Portsmouth, Va., and is said to be contemplating the construction of a storage and distributing plant, to cost \$100,000 with equipment.

The City Council, Greensboro, N. C., plans the installation of pumping machinery in connection with proposed waterworks extensions, to cost \$300,000. Bonds will be arranged. E. G. Sherrill is city clerk.

The Gold Dust Corporation, 239 West Thirtieth Street, New York, will install two 500-hp. boilers, coal and ash-handling machinery, refrigerating machinery and accessory equipment in the power house at its proposed plant at Baltimore, to cost in excess of \$750,000 with equipment. Lockwood, Greene & Co., 100 East Forty-second Street, New York, are architects and engineers.

Roberts Brothers, Monroe, Ga., have inquiries out for a 75-hp. crude oil engine, Diesel type, for a proposed cotton-ginning plant.

The Hackley-Morrison Co., Inc., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for six horizontal return tubular boilers, 150 hp., to operate under a 125-lb. working pressure; also for one 10-hp. motor, three-phase, 60-cycle, 220 volts.

The R. S. Armstrong & Brother Co., Atlanta, Ga., machinery dealer, has inquiries out for a clam shell bucket, 2-yd. capacity, single line type.

The Georgia-Tennessee Coal Co., recently incorporated, with headquarters at Atlanta, has acquired 4000 acres on Raccoon Mountain, near Chattanooga, Tenn., and will establish a coal breaker, tippie and mining plant. Transmission, conveying and hoisting and electrically operated power equipment will be required.

Pacific Coast

SAN FRANCISCO, March 25.

PLANs are being prepared by the Standard Gypsum Co., Citizens' National Bank Building, Los Angeles, for a new mill to be erected at Long Beach, adjoining the plant of the Craig Shipbuilding Co., estimated to cost \$300,000 with machinery.

The Schlage Lock Co., 435 California Street, San Francisco, manufacturer of locks and locking devices, has awarded a general contract to the Austin Co., 244 Kearny Street, for a one-story plant, 100 x 210 ft., to cost \$47,500.

The Western Cross Arm & Mfg. Co., Centralia, Wash., has preliminary plans for a steam-operated electric power plant estimated to cost \$100,000.

The Wade & Wells Fruit Co., Wenatchee, Wash., is considering the construction of a cold storage and refrigerating plant to cost about \$80,000 with machinery. James Wade heads the company.

The Board of Education, Pasadena, Cal., will soon begin the erection of a new vocational school on Lincoln Avenue to cost about \$85,000. Allison & Allison, Hibernian Building, Los Angeles, are architects.

The Merced Concrete Pipe Co., Merced, Cal., is completing plans for the establishment of new works at Woodland, Cal. B. J. Urkopina is general manager.

The Northwestern Electric Co., Portland, Ore., will ask bids in May for the construction of its proposed hydro-electric power house on the Lewis River, near Yale, Wash. It is being designed for a capacity of about 40,000 hp., and is estimated to cost \$1,500,000. The ultimate development at this point will approximate \$5,000,000.

The Northwestern Sugar Refining Co., Bank of Italy Building, Oakland, Cal., has tentative plans for a new mill at Kiesel Station, Cal., to cost \$1,000,000 with machinery. W. H. Ellison, Pacific Building, San Francisco, is engineer.

The Tucson Cotton Oil Co., Tucson, Ariz., is arranging for the early erection of a cottonseed oil mill, to cost about \$75,000 with machinery. O. J. Perry, superintendent of construction for the Western Cotton Oil Co., Phoenix, Ariz.,

will act in a like capacity for the Tucson project. E. A. McDonald is president.

The Pacific Motor Co., San Francisco, is closing negotiations for property at Serena, near Santa Barbara, Cal., as a site for a proposed assembly plant to cost about \$50,000.

The Oregon Short Line, Portland, Ore., operated by the Southern Pacific Co., is planning for the construction of an engine house with repair facilities at Twin Falls, Idaho.

The Rip Van Winkle Wall Bed Co., 792 Twenty-second Street, Oakland, Cal., will build an addition to its plant to cost \$35,000.

The Pan-American Oil Co., Los Angeles, will erect an oil storage and distributing plant at Colton, Cal., to cost \$80,000 with equipment.

Canada

TORONTO, March 30.

WHILE large lists of machine tools fail to appear, local dealers are receiving a good demand for single tools covering practically every line of activity. Buying, however, has been almost entirely for replacement. Several good sized orders were closed the past week for pulp and paper machinery and increased buying for waterworks and sewage plants is reported.

Wettlaufer-Mitchell Machinery, Ltd., Toronto, has been incorporated to manufacture exclusively all lines of machinery formerly made by Wettlaufer Brothers, Ltd., of Toronto. Manufacturing operations will be conducted at Mitchell, Ont., where arrangements are being made for the erection of a new plant near the Canadian National Railways station. Robert Stroud, who has been in charge of the manufacturing branch of Wettlaufer Brothers, will be general manager of the new company.

E. Leonard & Sons, Ltd., box 287, St. John, N. B., is in the market for an overhead traveling crane, 35 to 60 ft. span, capacity 10 to 25 tons, either hand or electric power.

The Ott Brick & Tile Co., Kitchener, Ont., is in the market for a 75-hp., also a 1- or 2-hp. a.c., 550 volt, three phase, 25 cycle, 500 to 750 r.p.m. motor.

The Empire Brass Mfg. Co., Ltd., London, Ont., is in the market for an air operated Collet chuck.

The Dominion Electric Heating Co., Grand Mere, Que., contemplates building a factory to cost \$50,000. M. T. D. Gazelle, 140 Amherst Avenue, Montreal, is manager.

It is stated that Procter & Gamble, Hamilton, Ont., contemplates building an addition to their factory on which construction will soon start.

John G. Klaehn, 129 King West, Kitchener, Ont., is preparing plans for an addition to the plant of the Goodrich Rubber Co., to cost \$100,000.

The Harriston Stove Works, Owen Sound, Ont., has started work on an addition to its plant to cost \$10,000. Some equipment will be purchased.

McFarlane, Pratt & Hanley, Ltd., Midland, Ont., have the general contract for the erection of a \$300,000 grain elevator there.

Barnet & McQueen, Fort William, Ont., have the general contract for the construction of a 1,000,000 bu. elevator at Owen Sound, Ont., to cost \$450,000, for the Great Lakes Elevator Co.

It is reported that the Ontario Hydro Electric Commission is planning further extensions in the Campbellford district, near Peterboro, Ont. It is also proposed to erect a dam and power house at Allan's Mills on Crowe River, about 12 miles from Peterboro.

The Montmorency Power Co., will start work this spring on a 6000 hp., development on the River aux Chiens, and will purchase hydraulic and electric equipment. Construction will be in charge of C. Camille Lessard, engineer, 132 Boulevard des Allies, Quebec.

The Watrous Engine Works Co., Ltd., Brantford, Ont., has received a repeat order from the Price Brothers Co., paper manufacturer, for 12 large caterpillar pulpwood grinders.

The Eco-Thermal Stove Co., Lebanon, Ohio, has begun the manufacture of stoves for domestic use. The company is headed by Stephen S. Thomas, president, and John A. Blair, treasurer and sales manager. The Eco-Thermal stove was first made in Warren, Ohio, but the patents were obtained by the present owners and the business was moved to Lebanon.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general headings of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

Per Lb.

Bars:

Refined iron bars, base price.....	3.24c.
Swedish charcoal iron bars, base.....	7.00c. to 7.25c.
Soft steel bars, base price.....	3.24c.
Hoops, base price.....	4.49c.
Bands, base price.....	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base.....	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base.....	3.24c.
Steel plates, ¼ in. and heavier.....	3.34c.

Merchant Steel

Per Lb.

Tire, 1½ x ¼ in. and larger.....	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger).....	3.65c.
Toe-calk, ½ x ¼ in. and larger.....	4.20c.
Cold-rolled strip, soft and quarter hard.....	7.00c.
Open-hearth spring steel.....	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds.....	4.15c.
Squares, flats and hex.....	4.65c.
Standard tool steel, base price.....	15.00c.
Extra tool steel.....	18.00c.
Special tool steel.....	23.00c.
High-speed steel, 18 per cent tungsten.....	70c.

Sheets

Blue Annealed

Per Lb.

No. 10.....	3.89c.
No. 12.....	3.94c.
No. 14.....	3.99c.
No. 16.....	4.09c.

Box Annealed—Black

Soft Steel
C. R. One Pass
Per Lb.

Blued Stove
Pipe Sheet
Per Lb.

Nos. 18 to 20.....	4.30c. to 4.45c.	.....
Nos. 22 and 24.....	4.45c. to 4.60c.	5.10c.
No. 26.....	4.50c. to 4.65c.	5.15c.
No. 28*.....	4.60c. to 4.75c.	5.25c.
No. 30.....	4.70c. to 4.95c.	.....

Galvanized

Per Lb.

No. 14.....	4.70c. to 4.85c.
No. 16.....	4.85c. to 5.00c.
Nos. 18 and 20.....	5.00c. to 5.15c.
Nos. 22 and 24.....	5.15c. to 5.30c.
No. 26.....	5.30c. to 5.45c.
No. 28*.....	5.60c. to 5.75c.
No. 30.....	6.10c. to 6.25c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

Standard Weld

Black Galv.

Wrought Iron

Black Galv.

½ in. Butt... 46	29	½ in. Butt... 4	+19
¾ in. Butt... 51	37	¾ in. Butt... 11	+9
1-3 in. Butt... 53	39	1-1½ in. Butt... 14	+6
2½-6 in. Lap 48	35	2-in. Lap... 5	+14
7 & 8 in. Lap 44	17	3-6 in. Lap... 11	+6
11 & 12 in. Lap 37	12	7-12 in. Lap... 3	+16

Bolts and Screws

Machine bolts, cut thread, 40 and 10 per cent off list
Carriage bolts, cut thread, 30 and 10 per cent off list
Coach screws, 40 and 10 per cent off list
Wood screws, flat head iron,
72½, 25, 10 and 5 per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER

Per Lb.

Bright, basic.....	4.25c. to 4.50c.
Annealed soft.....	4.50c. to 4.75c.
Galvanized annealed.....	5.15c. to 5.40c.
Coppered basic.....	5.15c. to 5.40c.
Tinned soft Bessemer.....	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet.....	18½c. to 19½c.
High brass wire.....	18½c. to 19½c.
Brass rods.....	16½c. to 17½c.
Brass tube, brazed.....	26½c. to 27½c.
Brass tube, seamless.....	23 c. to 24 c.
Copper tube, seamless.....	24 c. to 25 c.

Copper Sheets

Sheet copper, hot rolled, 21c. to 22c. per lb. base.
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade	Grade	Coke—14 x 30	Prime	Seconds
	"AAA"	"A"	80 lb...	\$6.15	\$5.90
	Charcoal	Charcoal	90 lb...	6.30	6.05
	14x20	14x20	100 lb...	6.45	6.20
	IC.. \$11.25	\$8.85	IC..	6.65	6.40
	IX.. 12.85	10.85	IX..	7.85	7.60
	IXX.. 14.40	12.55	IXX..	9.00	8.75
	IXXX.. 15.75	13.85	IXXX..	10.35	10.10
	IXXXX.. 17.00	15.05	IXXXX..	11.35	11.10

Terne Plates

8 lb. coating, 14 x 20

100 lb.	\$7.00 to \$8.00
IC.....	7.25 to 8.25
IX.....	8.25 to 8.75
Fire door stock.....	9.00 to 10.00

Tin

Straits, pig.....	57c.
Bar.....	60c. to 63c.

Copper

Lake ingot.....	16½c.
Electrolytic.....	16½c.
Casting.....	16 c.

Spelter and Sheet Zinc

Western spelter.....	9½c.
Sheet zinc, No. 9 base, casks.....	12c. open 12½c.

Lead and Solder*

American pig lead.....	10c. to 10½c.
Bar lead.....	13c.
Solder, ½ and ½ guaranteed.....	40c.
No. 1 solder.....	37c.
Refined solder.....	30½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.....	75c. to 90c.
Commercial grade, per lb.....	35c. to 50c.
Grade D, per lb.....	25c. to 35c.

Antimony

Asiatic.....	18c. to 20c.
--------------	--------------

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.....	36c.
---	------

Old Metals

The market is weak, prices are lower and business is very quiet. Dealers' buying prices are as follows:

	Cents
	Per Lb.
Copper, heavy crucible.....	11.75
Copper, heavy wire.....	11.25
Copper, light bottoms.....	9.50
Brass, heavy.....	7.00
Brass, light.....	6.75
Heavy machine composition.....	8.50
No. 1 yellow brass turnings.....	8.00
No. 1 red brass or composition turnings.....	8.25
Lead, heavy.....	7.00
Lead, tea.....	5.25
Zinc.....	4.25
Cast aluminum.....	17.00
Sheet aluminum.....	17.00